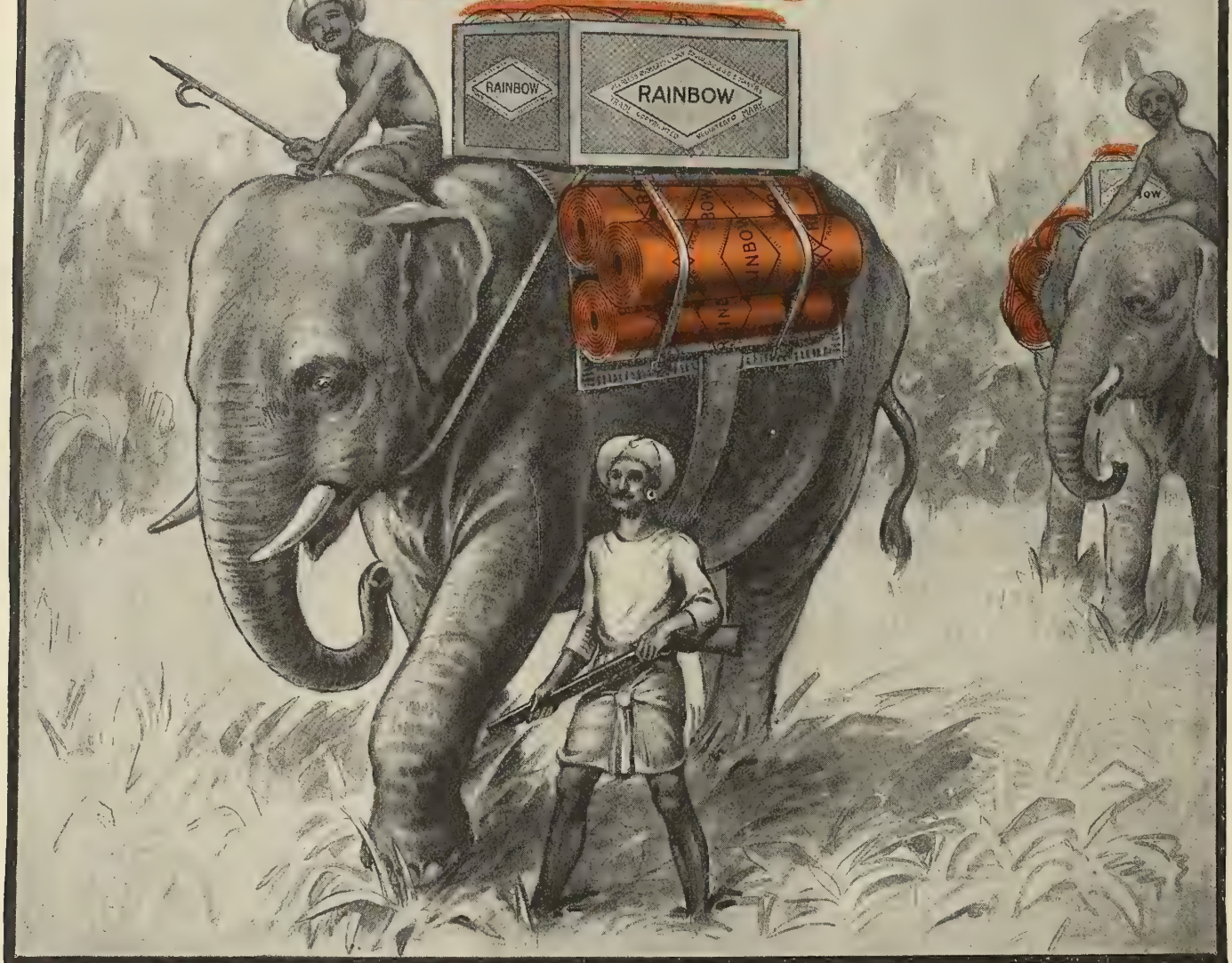
# LACK OF RAILROAD FACILITIES DO NOT PREVENT THE DELIVERY OF "RAINBOW PACKING"

## ENGINEERS AT REMOTE PLACES ALL OVER THE GLOBE DEMAND THE PACKING THAT HAS PROVEN ITSELF TO BE THE "BEST BY TEST"




MANUFACTURED EXCLUSIVELY BY

## PEERLESS RUBBER MANUFACTURING COMPANY

## 16 WARREN ST., NEW YORK.

DETROIT, MICH.-16-24 WOODWARD AVE.
CHICAGO, ILL.-WELLS & MICHIGAN STS.
PITTSBURG, PA.-425-427 FIRST AVE.
SAN FRANCISCO, CAL.-39-51 STEVENSON ST.
SPOKANE, WASH.-RAILROAD & STEVENS STS
SALT LAKE CITY, UTAH-257 MAIN ST.
NEW ORLEANS, LA.-808-821 TCHOUPITOULAS ST.

SEATTLE, WASH.-FIRST & KING STREETS
CHATTANOOGA, TENN.-1106-1120 MARKET ST.
INDIANAPOLIS, IND.-38-42 SO. CAPITOL AVE.
DENVER, COL.-1556 WAZEE STREET.
HELENA, MONT.-113-117 MAIN ST.
PORTLAND, ORE.-69-75 N. 12TH ST.
PHILADELPHIA, PA.-19 NORTH SEVENTH ST.

BOSTON, MASS.-110 FEDERAL ST.
BUFFALO, N.Y.-379-383 WASHINGTON ST.
ROCHESTER, N.Y.-24 EXCHANGE ST.
SYRACUSE, N.Y.-212-214 SO. CLINTON ST.
LOS ANGELES, CAL.-359 NORTH MAIN ST.
BALTIMORE, MD., 37 HOPKINS PLACE.
LOUISVILLE, KY., SECOND & WASHINGTON STS.

**FOREIGN AGENTS.**

LONDON, E.C. ENGLAND-CARR BROS. LTD. 11 QUEEN VICTORIA ST. PARIS, FRANCE-G. MEUNIER & C. MEUNIER 76 AVE. DE LA REPUBLIQUE
COPENHAGEN, DENMARK, H. ERICHSEN, CORT ADELERSGADE, 12. JOHANNESBURG, SOUTH AFRICA, NATIONAL TRADING CO. BARSDORF BL'DG.
SYDNEY, AUSTRALIA, PEERLESS RUBBER SELLING CO. LTD.

Launching of the $6,000,000 SUPER-DREADNAUGHT "NEW YORK," October 30th, 1912, at the New York Navy Yard.

# "TOCKOLITH"

**(CEMENT PAINT—PATENTED)**

# PROTECTOR OF THE PROTECTOR

## Super-Dreadnaught "New York"—U. S. Navy

For over two decades Red Lead has been used on ships of the U. S. Navy. The Super-Dreadnaught "New York," was the first ship to use a better Paint on the Steel Hull below the Water Line. Painted with a Foundation Priming, Anti-Corrosive Coating of "TOCKOLITH."

## Write for "TOCH'S Steel Paint Specifications"

# TOCH BROTHERS

**Inventors and Manufacturers for 64 Years of New and Better Painting Materials.**

**320 Fifth Avenue** Works: LONG ISLAND CITY, N. Y. TORONTO, CANADA **NEW YORK**



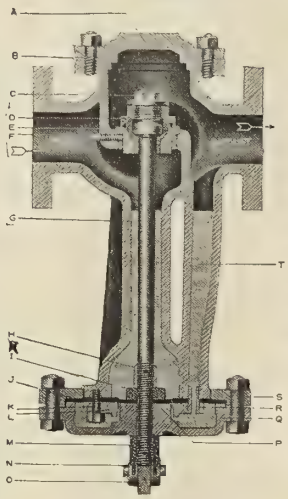
*When writing to advertisers, please mention* INTERNATIONAL MARINE ENGINEERING.

# AULD

"Quitetite Type"

# REDUCING VALVE

**Accurate regulation of reduced pressure. Shuts off "dead tight." Occupies little space.**



This well-known Reducing Valve, made for so many years by the Auld Company of Glasgow, Scotland, is now made in the U. S. by the Schutte & Körting Co. We have already sold quite a number of these valves which are giving absolute satisfaction. This valve is extremely accurate, and having no sleeves or shifting boxes there is no friction, therefore no irregular working.

Constant reduced pressure is maintained even with great fluctuations in initial pressure.

**Write for Catalog 8-R.**

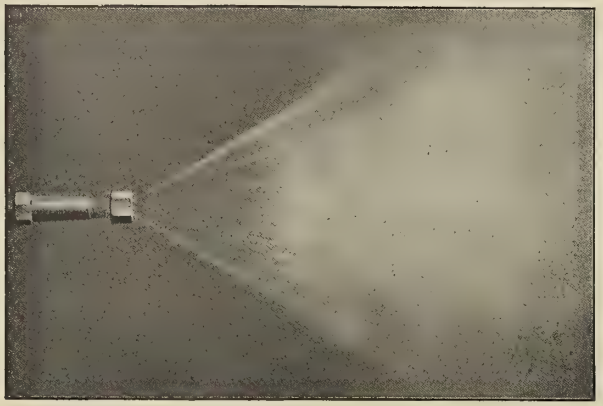
## AULD COMPANY

**1255 North 12th St.**

**PHILADELPHIA, PA.**

# OIL BURNING

**Without Steam or Air**



## KÖRTING MECHANICAL SYSTEM

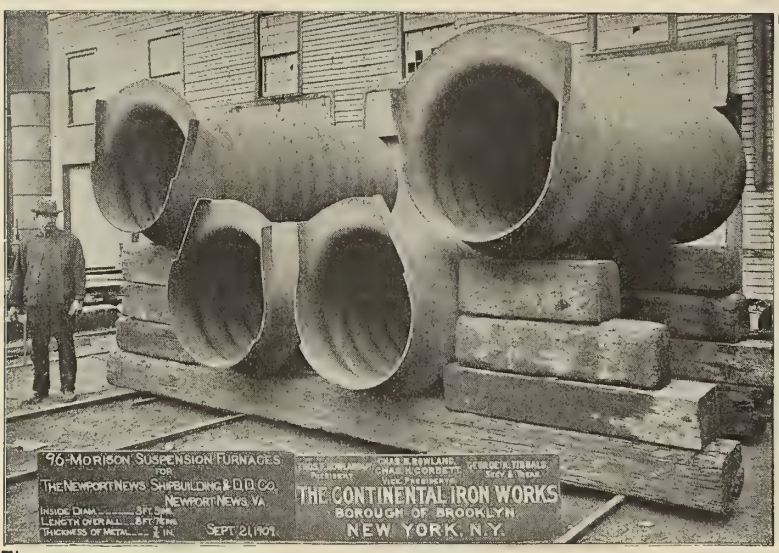
Atomizes the oil by mechanical means, i. e., without steam or air as the atomizing medium. The System operates smokeless and noiseless, and installations on various types of vessels, stationary plants, etc., total over 150,000 Horse power.

**Write for a copy of our new bulletin 6-0 descriptive of this system.**

**Schutte & Körting Company**

**PHILADELPHIA, PA.**

NEW YORK, 50 Church Street
BOSTON, 98 High Street
SAN FRANCISCO, O. C. Goeriz & Co.
PORTLAND AND SEATTLE., E.P. Jamison & Co.,
CHICAGO, Security Building
PITTSBURGH, Keenan Bldg.
CLEVELAND, New England Bldg.
DENVER, 1710 Glenarm St.




# MORISON SUSPENSION FURNACES

# FOR MARINE AND LAND BOILERS

**UNIFORM THICKNESS**
**EASILY CLEANED**
**UNEXCELLED STRENGTH**

**MADE TO UNITED STATES,**
**LLOYDS BUREAU VERITAS**
**OR ANY OTHER REQUIREMENTS**

**MADE IN THE UNITED STATES BY**

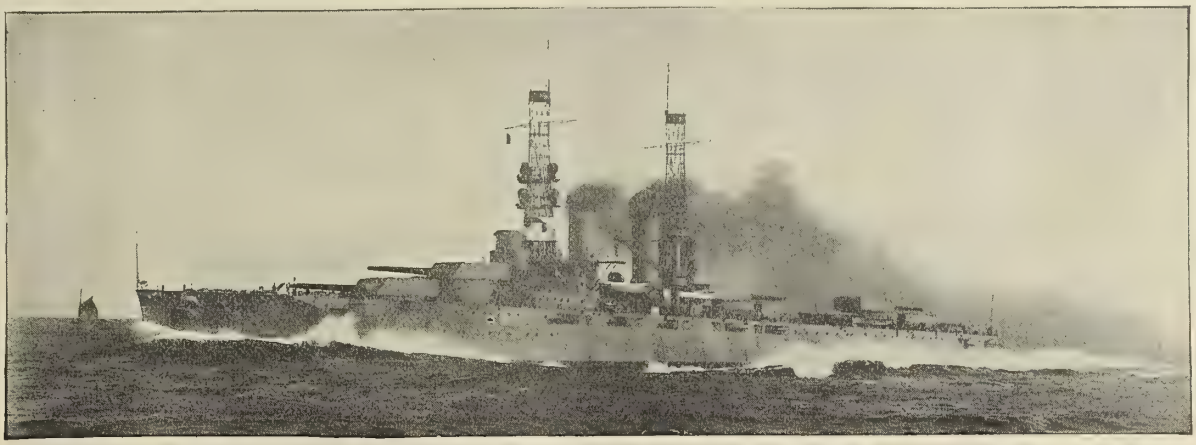
## THE CONTINENTAL IRON WORKS

**West and Calyer Streets, BOROUGH OF BROOKLYN, NEW YORK**

**Near 10th and 23d Street Ferries**

# Sturtevant

REG. U. S. PAT. OFF.



**ON THE UNITED STATES BATTLESHIP WYOMING ARE INSTALLED**

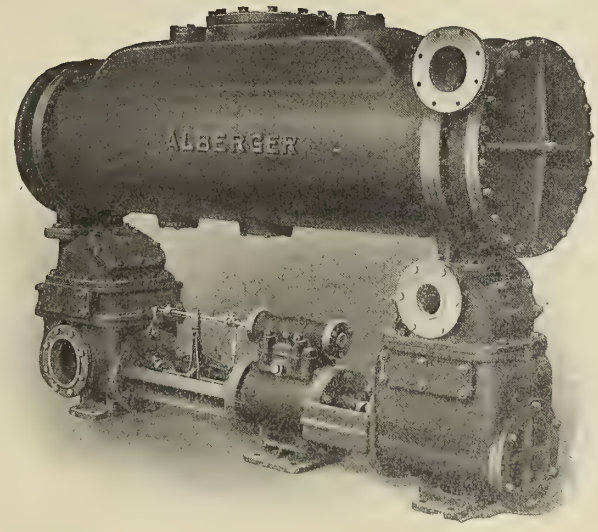
40 Hull Ventilation Fans, aggregate capacity, 218,500 CFM.
12 Forced Draft Fans, aggregate capacity, 342,000 CFM.
12 Portable Ventilating Sets, aggregate capacity 5,100 CFM.

A Total of 64 STURTEVANT Fans, with an aggregate capacity of 565,600 cubic feet per minute.
The Arkansas, a sister ship, has a similar equipment.
Sturtevant apparatus meets the rigid requirements of the United States Navy.
The Sturtevant Company are prepared to meet any and all requirements for fans and electrical apparatus for marine use.

**B. F. STURTEVANT CO., Hyde Park, Boston, Mass.**

**And all Principal Cities of the World**

923




# ALBERGER

**Pumping and Condensing Equipments for**

# Marine Service

## ALBERGER PUMP AND CONDENSER COMPANY

**140 CEDAR STREET NEW YORK**

## SHERIFFS MANUFACTURING CO.

ESTABLISHED 1854

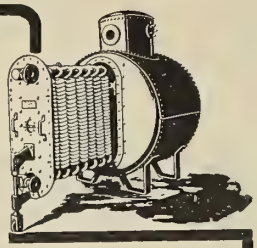
# Marine Machinery

AND

Over 3,000 Sheriffs' Propeller Wheels, made to date, of the best material and castings, give desired results.

**MILWAUKEE, WIS., U. S. A.**

## Maximum Capacity In Minimum Space



That's just what the Reilly Multicoil Evaporator (Navy Type) gives because it is especially designed for use aboard ship where space, accessibility for quick repairs, and highest efficiency are absolutely essential with greatest economy of fuel.

By reasons of these superior advantages, the

## Reilly *Multicoil* Evaporator

(Navy Type)

has over *a million and a half horse power* to its credit afloat.

Reilly Evaporators consist of a number of spiral copper coils, wound to a small radius, each secured separately by ground union joints—all metal, no brazing. The coils are arranged vertically within the shell, and can be easily reached by means of a sliding door to which they are attached for replacing and cleaning without disturbing shell, piping or connections.

*Write for Bulletin No.* 302

**THE GRISCOM-RUSSELL CO.**

Succesors to The Griscom-Spencer Co., The Russell Engine Co. and The James Reilly Repair & Supply Co.

ENGINEERS MANUFACTURERS

Land and Marine

2124 WEST STREET BUILDING NEW YORK

## POSITIVE AND RAPID BOILER CIRCULATION

Maintained by our System in Scotch, Leg and Locomotive Types of Boilers

**ROSS SCHOFIELD COMPANY** 39 Cortlandt Street, NEW YORK

BOSTON ENGINEERING CO. Boston, Mass.

T. L. TOMLINSON 244 California St., San Francisco, Cal.

E. J. CODD CO. Baltimore, Md.

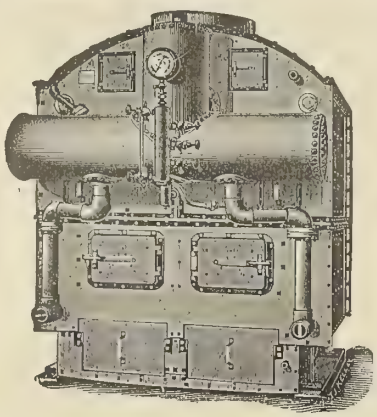
## Detail Drawings of a Four Furnace Single End Scotch Boiler

together with **Diagrammatic Pipe and Auxiliary Plan** used in connection with a

**1250 H.P. TRIPLE EXPANSION ENGINE, WITH KEY,** naming and describing every part of the engine. **Price, $1.00 Postpaid.**

**INTERNATIONAL MARINE ENGINEERING**

17 Battery Place, New York City



WE BUILD—light—compact—durable—accessible—sectional—**BOILERS**—for all marine purposes. ¶ Our new catalogue describes them, tells who has them, shows cuts of more than 280 vessels we have equipped.

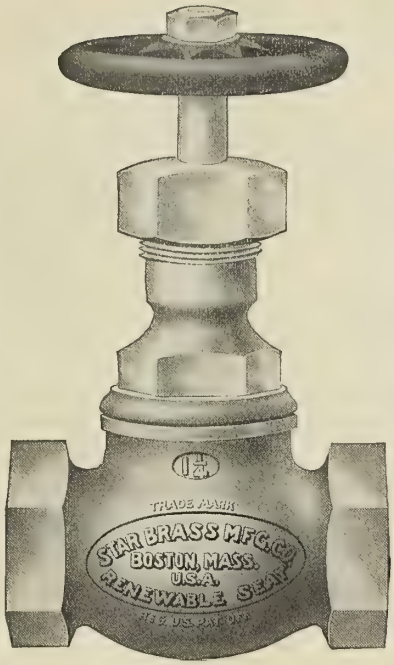
**Let us mail you one**

***ALMY WATER-TUBE BOILER CO.***

***PROVIDENCE, R. I.***

# The "Renewable"

## EXTRA HEAVY GLOBE MARINE VALVE




The most modern and thoroughly up-to-date globe valve at present on the market. By far the best globe valve for marine service yet produced, it being particularly adapted for high pressures, also for general severe marine work.

**SOME OF OUR SPECIAL FEATURES ARE ENUMERATED BELOW:**

All castings of our special bronze mixture, made from metal patterns on pneumatic molding machines.

All parts made with special tools, insuring absolute uniformity.

Body of special rugged design; steam is not retarded in its flow owing to body's form—it is so designed that metal is distributed where most needed for severe use.

Seat and Disc are both Renewable and extra heavy; the bevel or taper of both is at a sharp angle, with a very light bearing, insuring less liability of foreign matter lodging on seat when valve is closed, also less chance of wire drawing and cutting.

Seat rings are of a "Patented" form with special taper seat where screwed in body. This design insures a perfect joint and absence of liability to distortion from lack of care in installation or unequal expansion in use.

The bonnet is novel in design, having many unique features. First, it is absol tely self-draining, thereby eliminating all liability to freeze when used in cold positions; has extra large and deep packing space, gland and nut. Long thread in body, insuring strength and tightness.

Stems, or spindles are extra heavy, made with large "Acme" quick-opening threads.

Valves can be re-packed under pressure, when wide open, as top of discs seat against bottom of bonnet, making steam tight joint.

Handwheel is fastened to stem with hexagon nut, and can readily be removed and replaced.

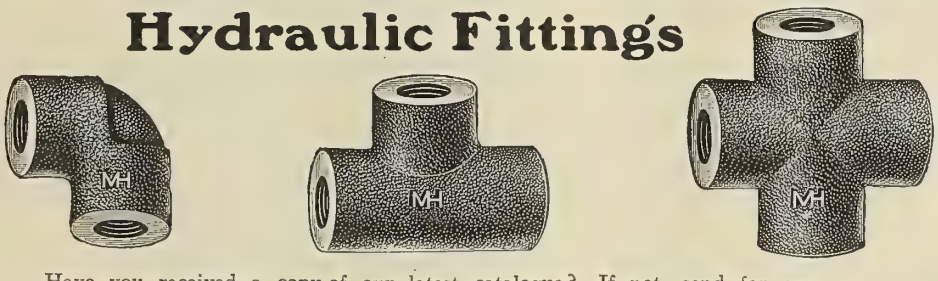
MANUFACTURED BY

## STAR BRASS MFG. COMPANY

**104-114 EAST DEDHAM STREET, BOSTON, MASS.** Branches: NEW YORK CITY, PITTSBURGH, PA., LONDON, ENGLAND

## McNAB & HARLIN MANUFACTURING COMPANY

### Hydraulic Fittings



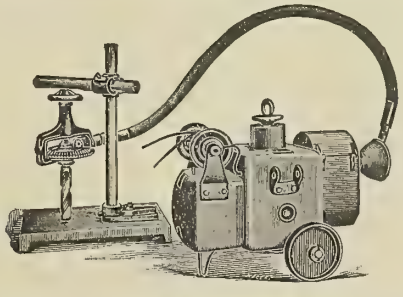

All our Hydraulic Fittings and Valves are made from Special Hydraulic Metal, and we guarantee them to stand 1,000 to 10,000 pounds pressure per square inch.

Many years' experience, the best equipment and thoroughly up-to-date methods of inspecting, testing and finishing have enabled us to produce ***perfect fittings.***

Have you received a copy of our latest catalogue? If not, send for one Prices furnished promptly upon application.

**Factory and Supply Store, PATERSON, N. J.**

**Sales and Executive Offices**
**55 John St., NEW YORK CITY**



**SELIG SONNENTHAL & CO.**
35 Queen Victoria Street
London, Eng.

## STOW MFG. CO., BINGHAMTON, N. Y.

Established 1875

INVENTORS AND LARGEST MFRS. IN THE WORLD OF THE

## STOW FLEXIBLE SHAFT

*FOR ALL PURPOSES*

Our Combination of FLEXIBLE SHAFT and MULTI-SPEED ELECTRIC MOTOR is almost indispensable on any vessel having an Electric Current, for portable DRILLING, TAPPING, REAMING, etc. It can be easily transported to any part of the same, and repairs made in a fraction of the time required by hand. Correspondence solicited.

*WRITE FOR CATALOGUE AND PRICE LIST*

U. S. S. MAYFLOWER
The Private yacht of the President of the United States, fitted with 3000 H. P. of Mosher Water Tube Boilers

**MOSHER WATER TUBE BOILERS**

THE SIMPLEST AND MOST COMPACT BOILER MADE

More than 100,000 Horsepower installed in U. S. Naval Vessels alone

**MOSHER WATER TUBE BOILER CO.**
30 Church Street, New York

E. P. JAMISON & CO., Pacific Coast Representatives
Seattle Tacoma Spokane Portland
San Francisco Vancouver, B. C.

Third Edition of

**Practical Marine Engineering**

with additional chapters on

**Internal Combustion Engines**
**Steam Turbines Oil Fuels**
**Marine Producer Gas Plants**

This book is written for

**Marine Engineers and Students**

IT is devoted exclusively to the practical side of Marine Engineering and is especially intended for operative engineers and students of the subject generally, and particularly for those who are preparing for examinations for Marine Engineers' licenses for any and all grades.

The book is illustrated with nearly *four hundred and fifty diagrams and cuts* made especially for the purpose, and showing the most approved practice in the different branches of the subject. The text is in such plain, simple language that any man with an ordinary education can easily understand it.

**Price, $5.00 (21/-)**

FOR SALE BY

**INTERNATIONAL MARINE ENGINEERING**
17 Battery Place, New York 31 Christopher St., Finsbury Square, E. C., London

**The Babcock & Wilcox Co.**
NEW YORK and LONDON

Forged Steel
**Marine Water-Tube Boilers**
and
**Superheaters**
for

**Naval Vessels** **Merchant Steamers**
**Ferry Boats** **Yachts and Dredges**

These boilers hold the record for economy, capacity and endurance in the Navies of the World.

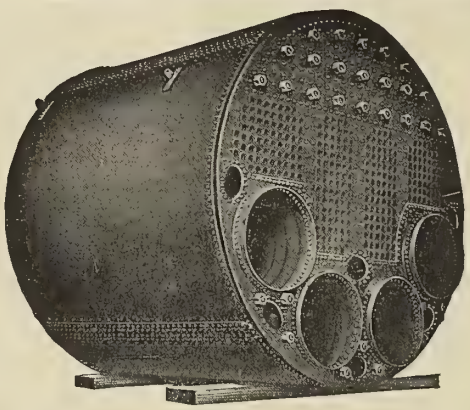
They have shown the same characteristics in the Merchant Marine. Babcock & Wilcox Boilers and Superheaters in one vessel are *saving more than 15 per cent.* over Scotch boilers in sister vessels.

*Is a reduction in your coal bill of any interest to you?*

Babcock & Wilcox Boilers have all essential parts heavier than corresponding parts in Scotch boilers, giving greater security against corrosion. They are lighter, safer, easier to clean and to operate than Scotch boilers, and much more efficient.

We are constantly receiving "repeat orders" from owners of merchant vessels who have had many years' satisfaction from the earlier installations.

**Write us for details**

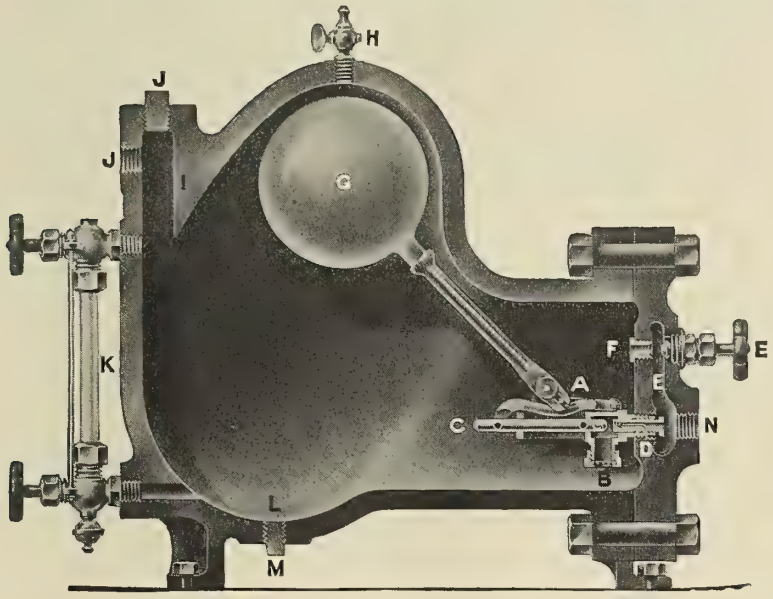


**Marine Boilers**
**Of All Types**

**Centrifugal Pumping Machinery**

**KINGSFORD FOUNDRY AND MACHINE WORKS**
**OSWEGO, N. Y.**

# THE IDEAL STEAM TRAP




***Perfection of design, carefully selected material, thorough workmanship; these are the elements that combine to make the Ideal Steam Trap all that its name implies.***

Its money saving quality, through prevention of waste, commends it to the owner; while its freedom from troublesome breakdowns commends it to the engineer.

These are some of the reasons for its selection for use on the largest battleship known as well as for smaller vessels.

For this trap no pressure is too high, no amount of water to be discharged too great.

*Write us for further information as to the ability of the Ideal Trap to do your work.*

## TILLOTSON HUMIDIFIER CO.

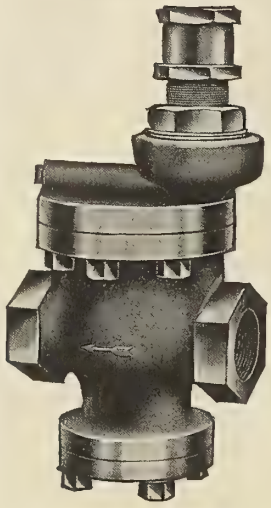
**78 FOUNTAIN STREET**

**PROVIDENCE, R. I.**

FOR CLOSE REGULATION
SPECIFY

LYTTON

Stay-Put Reducing Valves



Shuts off when Consumption Stops.

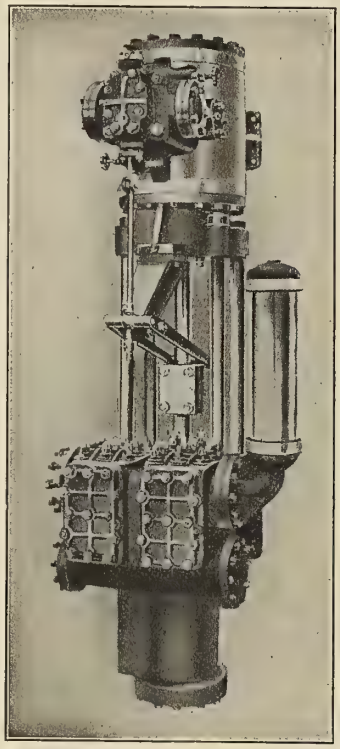
Reduced pressure can be changed while in operation.

*Send for Bulletin No. 4*

LYTTON MANUFACTURING CORPORATION

Makers of Lytton Marine Traps
Reducing Valves and Blow-off Valves

Main Office and Works: FRANKLIN, VA.



BLAKE PUMPS

FOR

NAVAL AND MERCHANT MARINE

are the standards of the world.

They are installed on the largest and swiftest vessels.

Full information as regards sizes, specifications, etc., for any pumping service can be had upon application.

*Send for Catalogue* BK106-43

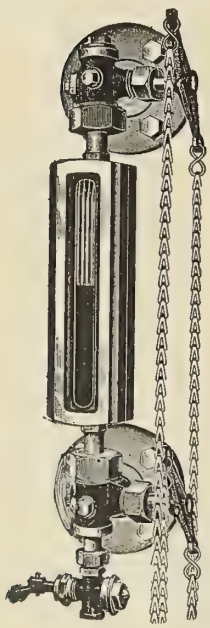
THE BLAKE & KNOWLES STEAM PUMP WORKS

WORKS: EAST CAMBRIDGE, MASS.

MARINE DEP'T: 115 BROADWAY, N. Y. CITY, N. Y.

B 10.2

JERGUSON



Engineering Specialties

REFLEX WATER GAGES

Used on all types of boilers by all the Principal Navies of the World

"THE WATER SHOWS BLACK"

ADVANTAGES:

Quick and reliable observation of the water level. Safe, sure and durable at high pressures. Not affected by cold air drafts. Most effective protection against injuries to boilers and workmen. Easily applied to all types of gauge glass fittings.

When filled with WATER the Reflex Gage always appears BLACK. When empty it instantly shows WHITE. No mistake possible. This feature alone is worth many times the cost of the Reflex.

Send for catalog of Water Gage Apparatus.

MANUFACTURED BY THE

JERGUSON GAGE & VALVE CO.

504 Broad Building, BOSTON, MASS.

The Parsons Marine Steam Turbine Co., Ltd.

TURBINIA WORKS

Wallsend-on-Tyne

England

*Total Horsepower of Parsons Marine Steam Turbines, built and under construction, is approximately 8,211,000.*

OFFICE: 97 Cedar Street, New York

# ISHERWOOD SYSTEM

**OF**

# SHIP CONSTRUCTION

**MEANS**

**Increased Strength**
**Increased Capacity for Bale Goods**
**Increased Deadweight Carrying Capacity**
**Improved Ventilation**
**Reduced Cost of Maintenance**
**Reduced Vibration**

224 Vessels, representing about 1,000,463 Gross Register Tons Building or Under Construction

**51 BUILDERS—77 OWNERS**

## Oil Tank Steamers a Specialty

70 Bulk Oil Carriers, representing about 363,500 Gross Register Tons, Built and Being Built

INCLUDING

Several Steamers each to carry 15,000 Tons Deadweight

---

**SEND FOR PARTICULARS TO**

# J. W. ISHERWOOD

**4, LLOYD'S AVENUE, LONDON, E. C.**

**Tel. Add. "Ishercon, London"**

**OR TO**

**S. C. CHAMBERS & COMPANY, 3, KING STREET, LIVERPOOL**

# SMOOTH-ON

## IRON CEMENTS

Permanently stop all leaks of steam, water, fire or oil; proved by years in use.

New illustrated instruction book No. 12 free.

**SMOOTH-ON MFG. CO.**

**JERSEY CITY, N. J.**

**231 N. Jefferson Street, Chicago**

**36 Sacramento Street San Francisco**

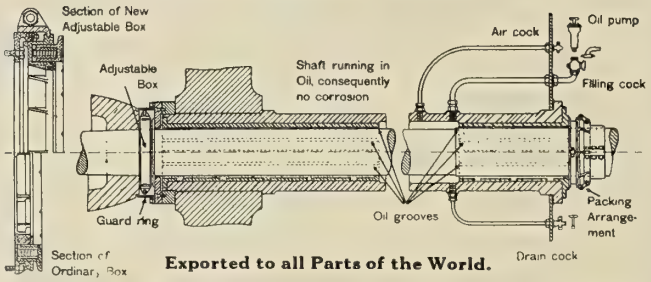
**8 White Street, Moorfields, E. C., London**

SEND FOR THIS FREE BOOK

CEDERVALL'S PATENT

# PROTECTIVE LUBRICATING BOXES

***For Propeller Shafts***




**Exported to all Parts of the World.**

These Boxes have been Highly Satisfactorily Applied to Men of War of several Nations and Merchant Steamers (with Shafts ranging from 3-inches to 18¼-inches in diameter.)

Old Stern Tube Arrangements can be altered for application of this Lubricating Box at a very Nominal Cost.

**Manufacturers**

**F. R. CEDERVALL & SÖNER**

**GOTHENBURG, (SWEDEN)**

AGENTS:—*England, East Coast:* Jos. Johnson, Newcastle-on-Tyne. *England, West Coast:* Maxton & Sinclair, Liverpool. *Scotland and Ireland:* John C. Kincaid & Co., Ltd., Greenock. *Bergen:* C. Dahm. *Haugesund:* Fritjof Eides Eftfg. *Stavanger:* D. Balchen.

# THE STEEL TUBE—THE MODERN BOILER TUBE

**SPELLERIZED STEEL LAP-WELD BOILER TUBES.**
**SHELBY SEAMLESS COLD-DRAWN STEEL BOILER TUBES.**
**SHELBY SEAMLESS HOT-ROLLED STEEL BOILER TUBES.**

¶ The SPELLERIZED STEEL BOILER TUBE is made by roll-knobbling the steel while hot. This working of the metal has the effect of making the structure more dense and more homogeneous. An internal hydrostatic pressure test of 500 to 1,000 pounds, according to the size, is applied to each tube.

¶ SHELBY SEAMLESS COLD-DRAWN STEEL BOILER TUBES are entirely seamless, and are made from a special steel that gives great strength, combined with the proper elastic limit and elongation. These tubes are tested with 1,000 pounds internal hydrostatic pressure, and the regular manipulation tests.

¶ SHELBY SEAMLESS HOT-ROLLED BOILER TUBES, since being placed on the market, have been a decided success. These are also subjected to the regular manipulation tests and 1,000 pounds internal hydrostatic pressure.

¶ A new book—THE MODERN BOILER TUBE—is just off the press. If you are interested in this subject, ask for a copy.

## National Tube Company

**General Sales Offices:**
**Frick Building, PITTSBURGH, PA.**

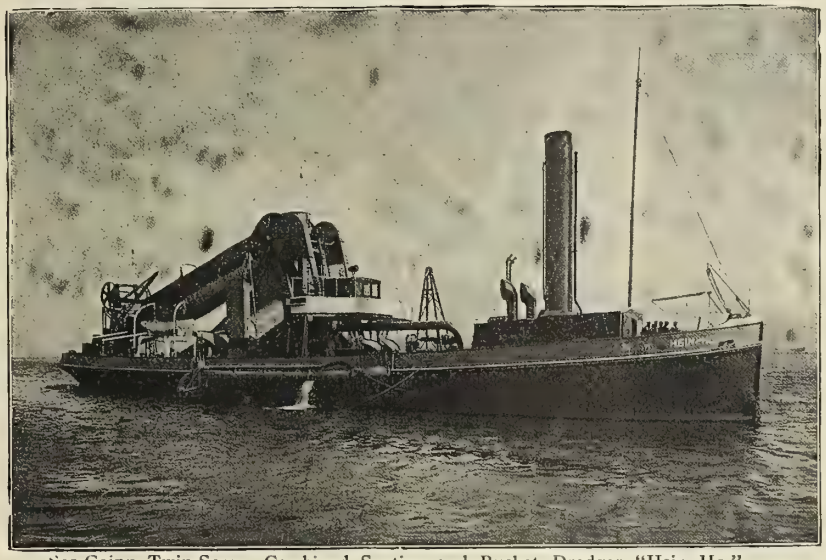
**District Sales Offices:** Atlanta Boston Chicago Denver New Orleans New York Philadelphia Pittsburgh St. Louis St. Paul Salt Lake City

**Pacific Coast Representatives:** U. S. Steel Products Co., San Francisco Seattle Portland Los Angeles.
**Export Representatives:** U. S. Steel Products Co., New York City.
**London Office: 36 New Broad Street, E. C.**

# DREDGING PLANT,

## FLOATING CRANES,

## COAL BUNKERING VESSELS.



Sea-Going Twin-Screw Combined Suction and Bucket Dredger "Hsin Ho."
Supplied to the Chinese Government

*Apply to . . .*

**WERF GUSTO**

**FIRMA A. F. SMULDERS,**

**SCHIEDAM (HOLLAND.)**

Sole Agency for the United Kingdom
ANDERSON RODGER
38 Victoria Street, Westminster, S. W.

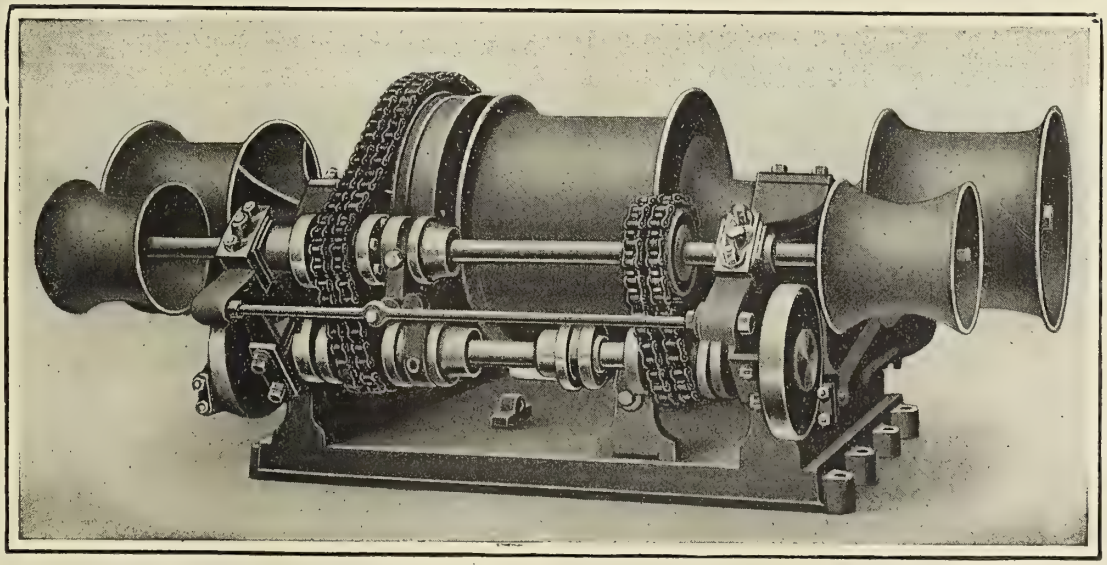
*Telegrams:*
*"ASMULDERS, SCHIEDAM."*

***FOR SALE.***

## THE AMERICAN RIGHTS

for the manufacture
. and supply of the .

## DAVID WILSON PATENT NOISELESS WINCH.



The Winch is known for its excellence throughout the United Kingdom, and has been described in the Shipbuilding & Engineering Journals as an indispensable part of the equipment of every high-class steamer.

It reduces friction, works silently under all conditions. No cost for repairs; no broken teeth.

Can be applied to any ordinary winch.

As supplied to
Austrian Lloyd,
John Brown Co.,
Canadian Government,
Can. Pac. Rly.,
Cammel Laird,
Denny Bros.,
Earls, Hull,
F. H. Powell Co.,
Gt. Cent. Rly.,
Grand Trunk,
Italian Gov.,
Johnston Line,
New Zealand Co.,
Rankin Black,
Vicker Maxim,
Shire Line,
Swan, Hunter Co.,
Russell Co.,
Workman & Clarke,
Belfast,
Etc.

*For further particulars apply . .*

**DAVID WILSON PATENT NOISELESS WINCH CO.**

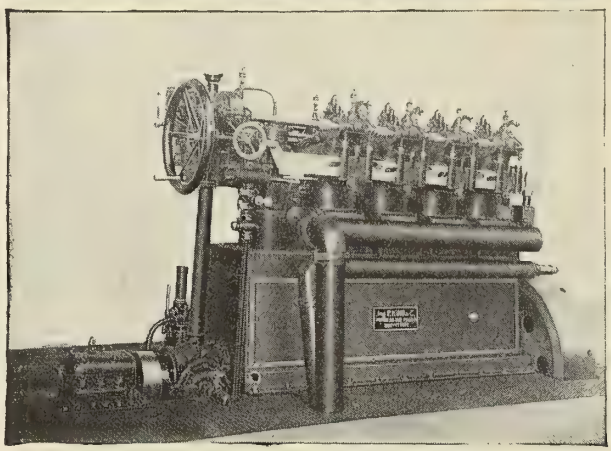
**21, Water Street, Liverpool.**

# KIND

## CRUDE AND TAR OIL MARINE TYPE ENGINES

FOR MARINE AND POWER PLANTS

CONTRACTORS TO ITALIAN NAVY



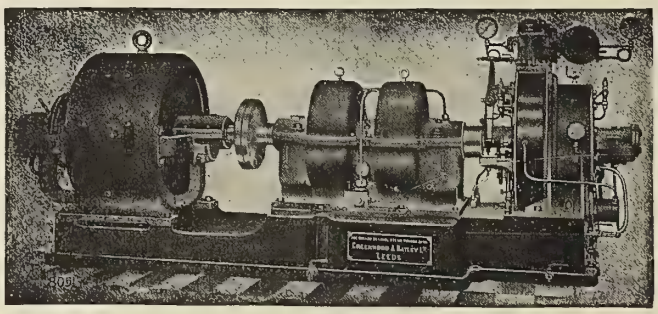
COMPLETE TAW-BOATS, FISHING BOATS, OR COMPLETE PROPELLING PLANTS FOR THE SAME, AND FOR CARGO BOATS, COASTERS, SUBMARINES, TORPEDO BOATS, ETC.

**ING. P. KIND & Co.**
**TURIN ITALY**

# GREENWOOD & BATLEY, LIMITED,
**LEEDS.**

**Engineers & Machine Tool Makers.**

De Laval Steam Turbines, Turbine-Dynamos, Turbine-Pumps, and Turbine-Fans.



UNEQUALLED FOR SHIP LIGHTING.

Compact. Light. Efficient. Reliable.

*Write for Catalogue—*

No. 13.—General description of De Laval Turbine.
No. 14.—Turbine-Motors.
No. 15.—Turbine-Dynamos and Alternators.

# SHIPS' EQUIPMENTS

Deck Pillars, Boats' Davits, Masts, Defence Booms, Derricks,
MADE OF MANNESMANN WELDLESS STEEL TUBES.

LIGHT, RELIABLE, ECONOMICAL SUBSTITUTES
for Solid Articles.

*Highest Awards at Franco-British Exhibition.*

**THE BRITISH MANNESMANN TUBE CO. LTD.**

SALISBURY HOUSE, LONDON, E.C.

Works: LANDORE, R.S.O., South Wales.




*When writing to advertisers, please mention* INTERNATIONAL MARINE ENGINEERING.

Patent
"Hezzanith" Binoculars.

# HEATH & CO. LTD.,

*Observatory Works,*
**CRAYFORD, LONDON.**
ESTABLISHED 1845.

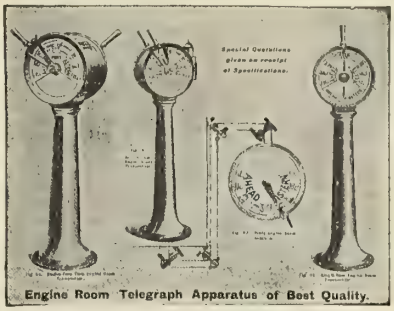
Cables and Telegrams: POLARIS, LONDON. HEATH, CRAYFORD.
Codes: ABC 5th Ed. "Hezzanith."

CATALOGUES FREE ON APPLICATION.

Grand Prix
Naval Exhibition
Bordeaux, 1907.

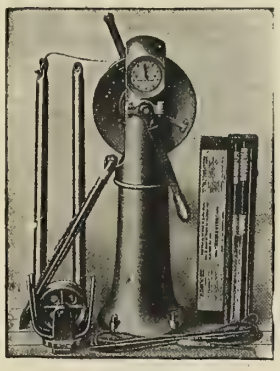
TRADE MARK:
"HEZZANITH"

Gold Medal
Naval Exhibition
London, 1905.

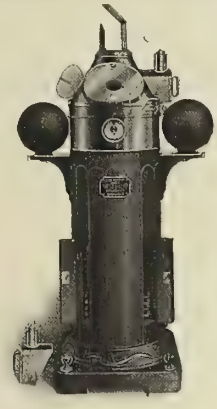


Engine Room Telegraph Apparatus of Best Quality.

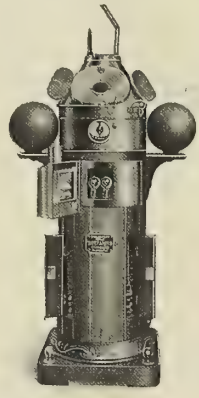
Engine Room, Docking and Steering Telegraph Apparatus of Best Quality.



"Hezzanith" Sounding Machines.

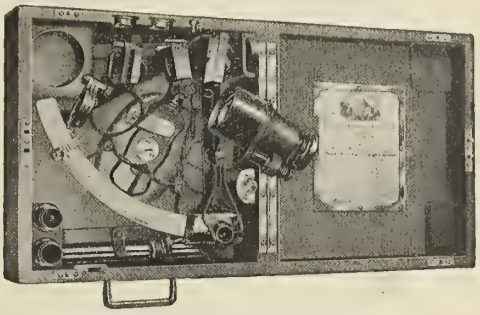


"Hezzanith" Mark I.



"Hezzanith" Mark II.

Patent Binnacles and Compasses.



**SEXTANTS of every description**
WITH OR WITHOUT KEW CERTIFICATES.
Specially made to meet the requirements of any Naval Officer or Nautical Academy.
Note the new patent "Semper Paratus" Endless Tangent Screw.
Instantaneous. Accurate. Simple. Reliable. Guaranteed.

**Please specify "HEZZANITH" Instruments in Outfits and Replacements.**

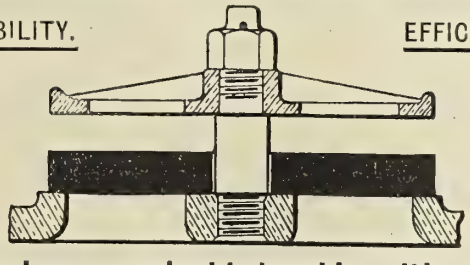
# "DEXINE"

ESTABLISHED 1895.

***DIRECT LIFT VALVES.***
***VALVES FOR ALL DUTIES.***

Made in all Shapes and for all Temperatures.
Retains the Vacuum better than any other make.

DURABILITY. EFFICIENCY.



**You have no doubt trouble with your Pump or Condenser Valves.**
**"DEXINE" will overcome all troubles.**
*And Write for List J.*

## The Dexine Patent Packing & Rubber Co. Ltd.

**STRATFORD, LONDON.**

*Telephone:* 355 STRATFORD.
*Telegrams:* "DEXINE, STRATFORD, LONDON."

# MODERN SHIP HEATING
and
# HOT WATER SUPPLIES.

**First Cost** should **Appeal** to **You.**

**Upkeep Cost** will **Enlighten You.**

**Standard** of **Comfort** will **Surprise You.**

If installed by

## ASHWELL & NESBIT, Ltd.

London, Glasgow,
Manchester and Leicester.

# KRAJEWSKI-PESANT CORPORATION—Habana, Cuba

HAVANA IRON WORKS

**HABANA STEEL FLOATING DRY DOCK 5,600 TONS LIFTING CAPACITY**

Cable Address: "IDOLWAX" HABANA

ADOLFO B. HORN, President

**OUR MARINE IRON WORKS** operating in combination with the Steel Dock are equipped with Large Machine, Foundry, Smithy, Boiler, Carpenter, Compressed Air and Oxy-Acetylene Departments. All classes of Marine Work can be handled in the quickest possible manner and at a reasonable price.

# MACHINE TOOLS FOR SHIPYARDS AND MARINE ARSENALS

Marine Engineers and Shipyard Officials furnished on request with our book "Ship and Navy Yard Equipments"

## NILES-BEMENT-POND CO.

111 BROADWAY, NEW YORK
25 VICTORIA STREET, LONDON

**NOW READY** **3rd EDITION**

Re-written, Up-to-date and Enlarged

# 'THE MARINE STEAM TURBINE'

By J. W. SOTHERN, M.I.E.S.

**Contains comprehensive illustrated descriptions of the Parsons and Curtis type Marine Turbines, together with constructive and general practical data.**

**200 ILLUSTRATIONS** **Price 12/6 net.**

**7th Edition.** NOW ON SALE. **Price 10/6 net.**

# "VERBAL" NOTES & SKETCHES

**FOR MARINE ENGINEERS.**

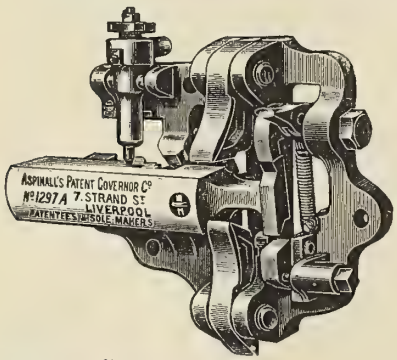
**640 Pages.** **515 Illustrations.**

By J. W. SOTHERN, M.I.E.S.

*Author, "Marine Indicator Cards," etc.*

ENLARGED, RE-WRITTEN AND RE-ILLUSTRATED.

Acknowledged to be the most practical book published on Verbal and Elementary Questions; is also invaluable as a general reference work for Marine Engineers of all grades.




# ASPINALL'S PATENT "MARINE" ENGINE GOVERNOR

***PREVENTS RACING AND BROKEN SHAFTS.***

*Adopted by all the Leading Lines, including—*

**P. & O. Co.**
**Union Castle.**
**Cunard.**
**White Star.**
**Pacific S. N. Co.**
**Royal Mail S. P. Co.**
**Hamburg-American.**
**North German Lloyd.**
**Compagnie Generale Transatlantique.**
**Compagnie Generale Italiana.**
**Austrian Lloyd.**
**Southern Pacific Co.**
**Nippon Yusen Kaisha, etc., etc.**

Fitted to over **2,000** Modern Steamers.

**Including the First Big Ocean-Going Motor Vessel**

# "SELANDIA"

TELEGRAMS: "VELO, LIVERPOOL."

*FOR PARTICULARS APPLY TO*

## ASPINALL'S PATENT GOVERNOR CO., 7, Strand Street, LIVERPOOL.

*AGENTS:* GLASGOW—A. BROWN & Co., 233, St. Vincent St.; NEWCASTLE-ON-TYNE—H. M. WILSON, Baltic Chambers, Quayside; LONDON and SOUTHAMPTON—C. CLIFFORDE PERKINS (Lester & Perkins), 6, Billiter St., London, E.C.

# POCAHONTAS FUEL COMPANY

**No. 1 BROADWAY, NEW YORK**

Sales Department of the Pocahontas Consolidated Collieries Co., Incorporated

MINERS, SHIPPERS, EXPORTERS AND BUNKER SUPPLIERS OF

## "ORIGINAL POCAHONTAS" COAL

**We Ship from 22 Mines in the Pocahontas Field**
**Shipment, 8,000,000 Tons per Annum by All Rail, Tidewater and the Great Lakes**

**LARGEST PRODUCERS OF SMOKELESS COAL IN THE UNITED STATES**

The average analysis made by the United States Government of 43 samples of "ORIGINAL POCAHONTAS" coal, taken from cargoes furnished by the Pocahontas Fuel Company, was as follows:

P. F. C. REGISTERED SIGNAL Hampton Roads

| | |
|---|---|
| Fixed Carbon | 74.81 per cent |
| Volatile Matter | 18.88 " |
| Sulphur | .67 " |
| Ash | 4.79 " |
| Moisture | .85 " |
| Total | 100.00 " |
| British Thermal Units | 15003 |

P. F. C. ORIGINAL POCAHONTAS Trade Mark

This coal is marketed under the brand of "Original Pocahontas." The first shipments of coal from the Pocahontas Field were made from the mines of the Pocahontas Consolidated Collieries Co., Inc., at Pocahontas, Virginia, in 1882, which mines have since continuously and are now mining the No. 3 vein and are shipping the highest grade of Pocahontas coal.

**LARGEST EXPORTERS OF SEMI-BITUMINOUS COAL IN THE UNITED STATES**

Cable Address: "Pocahontas." Codes: Watkins'; Scott's 10th; A, B, C 4th and 5th; Western Union and Lieber's

**No. 1 BROADWAY, NEW YORK**

**Branch Offices:—Bluefield, West Virginia, Pocahontas Buiidlng, Norfolk, Virginia, 117 Main St. Chicago, Illinois, Fisher Building. Cincinnati, Ohio, Traction Building. Boston, Massachusetts, Board of Trade Building.**

Agents and Distributors in New England:
New England Coal & Coke Co., 111 Devonshire Street, and Everett Dock, Boston, Mass.
Distributing Wharves;—Great Lakes—Sandusky, Ohio, and Toledo, Ohio
Tidewater Piers:—Lambert Point, Newport News and Sewall's Point, Norfolk, Va.

Tugs Bunkered at City Piers, Norfolk, Virginia.

**London Agents:—Evans & Reid, Ltd., 101 Leadenhall St., London, E. C., England**

Henry Coe & Clerici, Agents in Italy, Piazza S. Matteo 15, Genoa.

ISAAC T. MANN, President — CHARLES S. THORNE, Vice-President — THOMAS F. FARRELL, General Manager — ARTHUR J. MacBRIDE, Ass't Gen'l Manager — GEO. W. WOODRUFF, Treasurer

**POCAHONTAS FUEL CO., No. 1 Broadway, New York City, U. S. A.**



# CALLENDER'S BITRUBOL PAINT

STANDS VIBRATION AND EXPOSURE TO SEA-SPRAY.
**EFFECTUALLY PREVENTS CORROSION.**
PROOF AGAINST ACIDS AND ALKALIES.
WILL NOT CRACK OR FLAKE.
BEST FOR YACHTS.
**UNAFFECTED BY SEA-WATER.**
LARGE COVERING CAPACITY.
**PROTECTS STEEL OF SHIPS, PIERS, PONTOONS, ETC.**
UNRIVALLED FOR TANKS, COAL BUNKERS, STEEL DECKS.

IN DRUMS AND CASKS. PACKAGES FREE.

Send for Booklet M to

## George M. Callender & Co., Ltd.

Telegrams: QUARRIABLE, LONDON. 25, VICTORIA ST., LONDON, S.W.

## ARTHUR R. BROWN, 54, NEW BROAD STREET, LONDON, E.C.

**Shipbuilder, Engineer and Contractor.**

***Specialities:***—Passenger and Cargo Steamers for the Amazon and all kinds of Light Draft River Steamers, Tunnel Boats, Sternwheelers, Tugs, Launches, Lighters, Engines and Boilers, also Dredges for Mining and Harbour work.

*A large number of repeat orders received for Passenger Boats for the Amazon, and other places.*

Between **30** and **40** Gold, Tin and Platinum Dredges supplied to all parts of the World. These hold the record for the lowest working cost, greatest number of hours worked, and lowest cost of repairs.

***Repeat orders received from all parts of the World owing to successful working, in spite of a protective duty of 45 %.***

**WRITE FOR ILLUSTRATED CATALOGUE.**

Telephone No.:— 3418 LONDON WALL.
Telegraphic Address:— "EMBEDDED, LONDON."

Codes used:—A B C 5th edition, Liebers, Bedford McNeil.

# BATH IRON WORKS

LIMITED

BATH, MAINE

## Shipbuilders and Engineers

LICENSEE FOR

Parsons Marine Turbines

Normand Express Water Tube Boilers

Particular attention given to high speed requirements
Estimates furnished

# FORE RIVER SHIPBUILDING CO.

Established 1884. Incorporated 1904.

Shipbuilders and Engineers
War and Merchant Vessels
Curtis Marine Turbines
Holland Submarine Boats

Office and Works: QUINCY, MASS., U.S.A.

TURBINE STEAMSHIPS YALE AND HARVARD

## W. & A. FLETCHER CO.

PARSON'S MARINE TURBINES

Marine Engines, Boilers and Machinery of all Kinds

Contractors for Vessels Complete. HOBOKEN, N. J.

## Your Ship Coming to Puget Sound?

You'll find there one of the best equipped plants for handling large repair work. All sorts of Marine Installations.

12,000-Ton Floating Drydock now under construction—the largest on the Pacific Coast.

## SEATTLE CONSTRUCTION & DRY DOCK CO.

*Successor to The Moran Company*

SEATTLE, U. S. A.

# Only Dry Dock on Atlantic Coast

SOUTH OF NEWPORT NEWS

4500 TONS LIFTING CAPACITY

Two Marine Railways—One 1200 Tons, One 500 Tons

All kinds of Repairs done with despatch. Constant working force of 300 men

## MERRILL-STEVENS COMPANY, Jacksonville, Fla.

# *Newport News Shipbuilding & Dry Dock Co.*

*WORKS AT NEWPORT NEWS, VA.* *(On Hampton Roads)*

Equipped with three large Basin Dry Docks of the following dimensions:

| | No. 1 | No. 2 | No. 3 |
|---|---|---|---|
| Length on Top | 610 feet. | 827 feet. | 558 feet. |
| Width on Top | 130 " | 162 " | 147 " |
| Width on Bottom | 50 " | 80 " | 62 " |
| Draught of Water over Sill | 25 " | 30 " | 24 " |

SHOPS are equipped with modern machinery capable of doing the largest work required in ship construction. Tools driven by electricity and compressed air used in constructing and repairing vessels. For estimates and further particulars address

A. L. HOPKINS, Vice-President, 30 Church Street, New York

# TIETJEN & LANG DRY DOCK CO.

## HOBOKEN, N. J.

Nine Dry Docks: 600, 800, 1,000, 1,200, 1,400, 1,800, 2,000, 6,000, 10,000 Tons

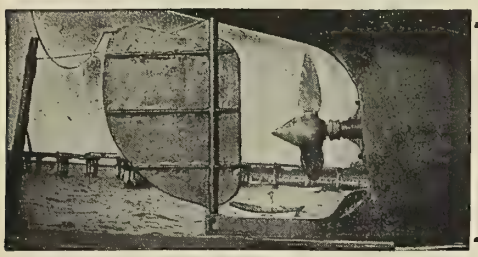
General Repairs on Wooden and Iron Vessels

17th STREET & PARK AVENUE

Telephone 700 Hoboken HOBOKEN, N. J.

**THE BRIDGEPORT** "A MOTOR THAT MOTES"
BRIDGEPORT MOTOR COMPANY
Send for "Motor Facts." BRIDGEPORT, CONN., U. S. A.

WE SELL ALL BOOKS ON MARINE ENGINEERING NOT OUT OF PRINT
INTERNATIONAL MARINE ENGINEERING
London: Christopher Street, Finsbury Square, E. C. New York: Whitehall Building, 17 Battery Place



**The Propeller** is the Most Important Part of Your Boat
THE BEST IS NONE TOO GOOD
ADJUSTABLE PITCH and REMOVABLE BLADE PROPELLERS
WILLIAM T. DONNELLY, 17 Battery Place, New York
WRITE FOR CATALOGUE

**MARINE ENGINE DESIGN**

Including the Design of Turning and Reversing Engines

By E. M. BRAGG

Assistant Professor of Marine Engineering and Naval Architecture, University of Michigan

CONTENTS

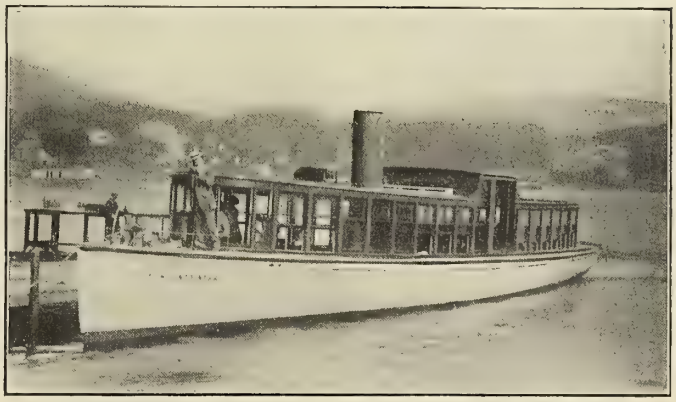
The Heat Engine. Calculations for Cylinder Diameters and Stroke. Strength of Materials and Factors of Safety. Cylinders. Pistons. Cylinder Covers. Calculations for Cylinders and Pistons. Maximum Load on Reciprocating Parts. Piston Rods. Allowable Pressure on Bearing Surfaces. Crosshead Blocks. Slipper. Calculations for Piston Rod, Crossman and Slipper. Connecting Rod. Crank Shaft Formula. Lloyds' Rules for Shafting. Bureau Veritas Rules for Shafting. American Bureau of Shipping Rules for Shafting. Crank Shaft Proportions. Maximum Loads on Main Bearing. Engine Bed. Main Bearing Caps. Engine Frame. Calculations for Crank Shaft and Main Bearings. Steam Speeds and Valve Diagrams. Location of Center Links of Cylinders. Calculations for Steam Speeds, Valves, Receiver Pipes and Distance between Cylinder Centers. Piston Valve, Slide Valves and Valve Gear. Calculations for Drag Rods, Eccentric Rods, Links, Eccentrics, Eccentric Straps and Reverse Shafts. Turning Engine Design. Reversing Engine Design.

175 Pages. 4¼ x 7½. Illustrated. Cloth, NET, $2.00

FOR SALE BY

**International Marine Engineering**

Whitehall Bldg., 17 Battery Pl. NEW YORK CITY
Christopher St., Finsbury Sq. LONDON, E. C.



*The Mountaineer.* 70-ft. passenger boat, 125 H.P. Standard engine
Owner, Lake Champlain Transportation Co.

**DEVELOPMENT**

Your money is saved in a thousand and one ways in

**The Standard Engine**

by its careful development of details. It is this high stage of development reached after years of hardest service that makes the STANDARD what it is,—a simple, practical, smooth-running unit—doing the greatest amount of work on the least amount of fuel and with the lowest upkeep cost.

The STANDARD is a heavy duty engine in the fullest sense—large bearing surfaces and minimum bearing pressures, positive oiling, simple ignition, easy adjustments, etc.

You can appreciate what this means in returns to you—GREATER PROFITS.

Increase your profits—write to-day for treatise catalogue.

Back of the STANDARD guarantee is the
**STANDARD MOTOR CONSTRUCTION COMPANY**

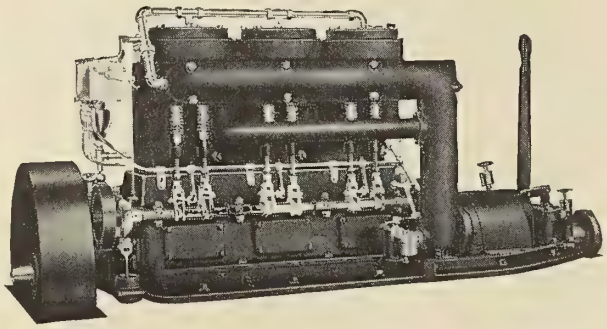
**THE CHARLES WARD ENGINEERING WORKS**
CHARLESTON, WEST VIRGINIA

WATER TUBE BOILERS, MARINE ENGINES
LIGHT DRAFT RIVER STEAMERS
YACHTS

Steel Boats for Export, "Knock-Down" or Sectional

# "WOLVERINE"

## The Motor with the Bore and Stroke



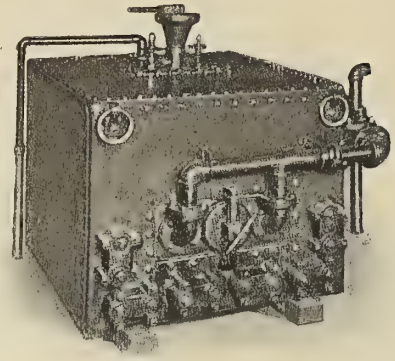
It is possible to equip your launch, tug, schooner or cruiser with a **Heavy Duty Engine** that will make it absolutely reliable and a **money-maker.**

**Fuels—Kerosene (Paraffin), Gasoline (Petrol), Suction Producer Gas, Distillate.**

"WOLVERINE" Engines have an extensive use in countries where lighter oils are hard to procure and prohibitive because of high price. The **heavier oils** give excellent results.

Catalog No. 73 contains full information.
Yours for the asking.

**WOLVERINE MOTOR WORKS**
**Bridgeport, Conn., U. S. A.**
(Formerly Grand Rapids, Mich.)



# FIRE EXTINCTION
# FUMIGATION

***No Damage to Cargo***

Grimm Sulphur Dioxide Gas Machine.
A "Clean Bill of Health"—*No Rats* or vermin.
Apparatus simple, economical—easily operated.
Used by American Hawaiian, Panama, Hamburg-American and others.
Full particulars on request.

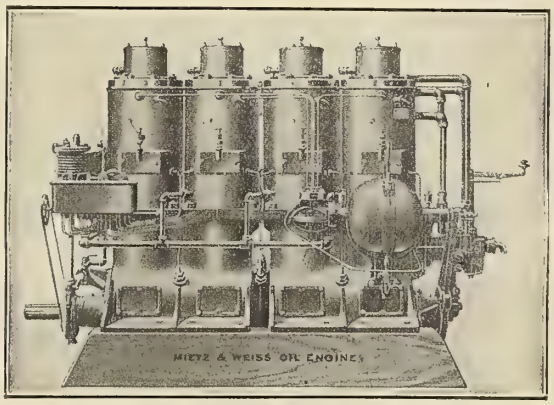
Fumigating & Fire Extinguishing Co. of America
29 BROADWAY, NEW YORK.
British Agents: Archibald Low & Sons, Ltd., Glasgow.

IN THE BUSINESS CENTER

# It Will Pay You to be Represented

. . . The Exhibition Department of the BOURSE presents an opportunity to Marine Engine and Boat Builders to maintain a permanent exhibit in the business center of the city, where they will come in contact with Buyers from all over the country. Address . . .

THE BOURSE, Phila.




# MIETZ & WEISS
# OIL ENGINES

**Reversing Gear Type, 2-60 H. P.** **Reversible Type, 75-600 H. P.**

Simplest, Safest and Most Reliable and Economical Marine Engines on the Market

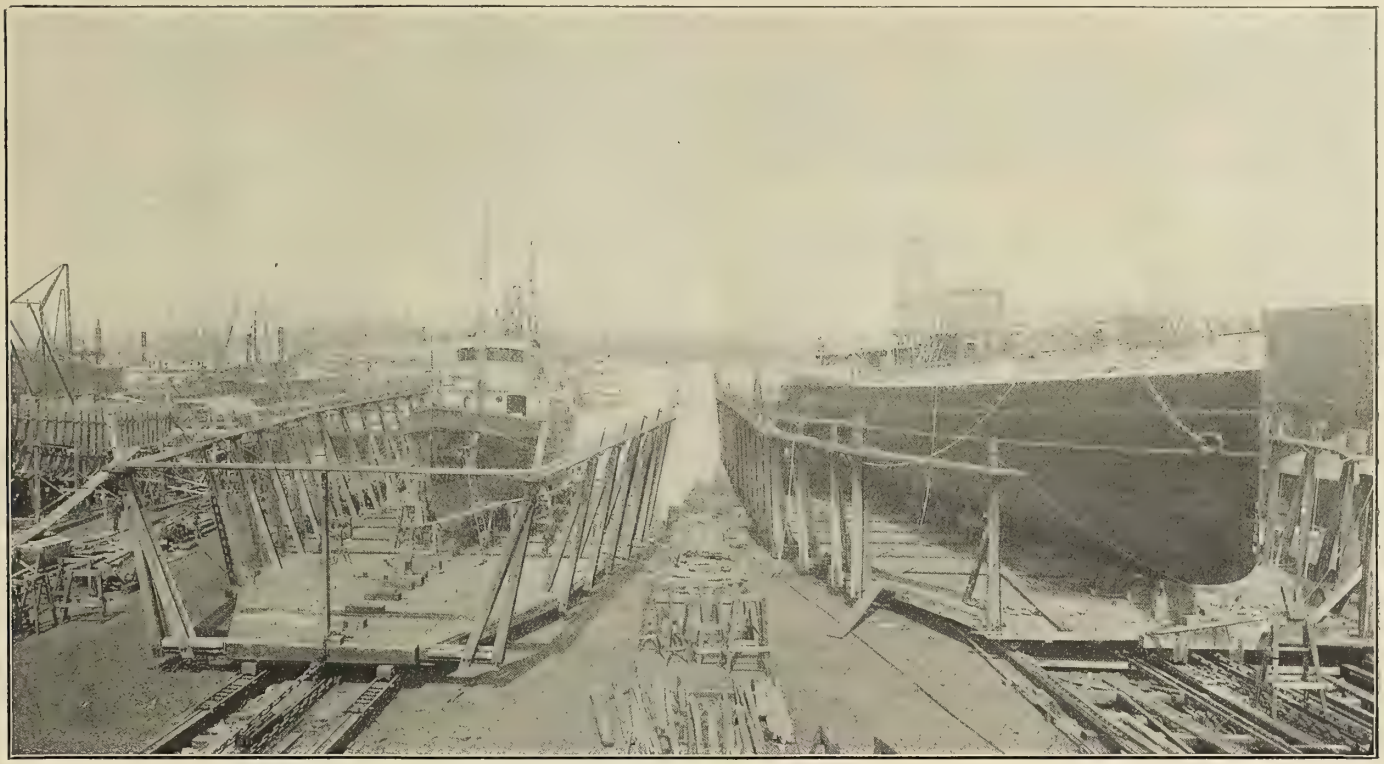
**Use Kerosene, Fuel Oil, Crude Oil, and Alcohol**

200,000 H. P. IN OPERATION

100 H. P. engine using three-cent-per gallon fuel, saves over gasoline at nine cents per gallon, about $1,800.00 per year, which represents a capital of $36,000.00 at 5% interest. The same saving can also be had over a steam plant of the same capacity.

*SEND FOR CATALOGUE*

**A. MIETZ, 130 Mott St., New York**

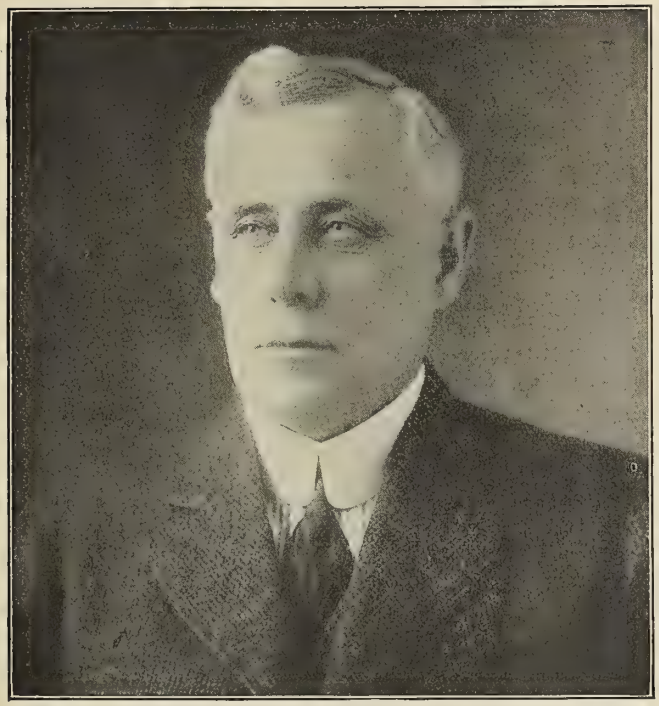


# RAILWAY DRY DOCKS

DESIGNED AND BUILT FOR ALL CLASSES AND TYPES OF VESSELS, TIMBER AND STEEL CONSTRUCTION

THE CRANDALL ENGINEERING COMPANY

Formerly H. I. Crandall & Son Co. EAST BOSTON, MASS.



This will identify our Subscription Manager

Mr. H. N. DINSMORE

who is authorized to take subscriptions in any part of the United States, Canada and Mexico, to collect the money due for new subscriptions and renewals, and to receipt for them in our name.

His mail should be sent to 37 West Tremlett Street, Boston, Mass.

International Marine Engineering
17 BATTERY PLACE, NEW YORK

HAMMERED
# FORGINGS

MARINE AND MISCELLANEOUS

ROUGH, SMOOTH OR MACHINED

Since the founding of this business 88 years ago we have always maintained the highest standard of workmanship. Our product is acknowledged by the marine trade the best that can be turned out.

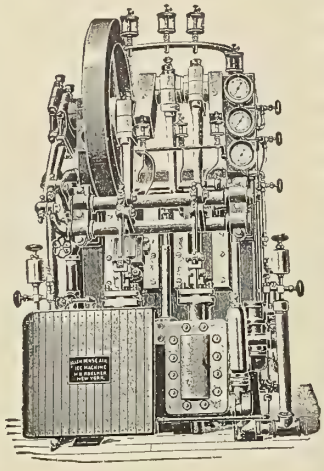
Send Sketch for Estimate. Delivery as Promised.
Satisfaction Guaranteed

ATKINSON-FRIZELLE COMPANY

CASTLE POINT DOCK
HOBOKEN

50 CHURCH STREET
NEW YORK

# The ALLEN DENSE-AIR ICE MACHINE



contains no chemicals, only air at easy pressure (65 lbs.), in pipes. It is placed in the engine room and attended by the regular engineers, while meat room and ice-making box and galley and pantry refrigerators are at their usual places.

**Steam Yachts**

Electra, Nourmahal, May, Josephine, Virginia, Thespia, Dorothea, Felicia, Aloha, Attaquin, Nydia, Alcedo, Enterprise, Alvena, Margaret, Kenawha, Pantooset, Rheclair, Aztec, Lorena, Constant, Riviera, Czarina, Rambler, Apache, Dreamer, Emrose, Sultana, Visitor II.

More than 250 are in active service on U. S. and foreign men-of-war, steam yachts and merchant steamers in the tropics.

**H. B. ROELKER**

**41 Maiden Lane, New York**

# THE ONLY STANDARD AMERICAN CLASSIFICATION OF SHIPPING

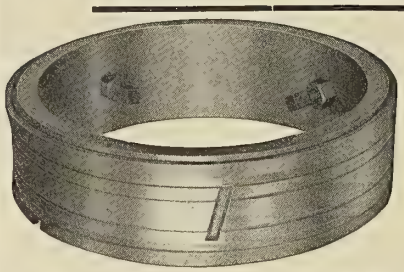
RECORD OF AMERICAN AND FOREIGN SHIPPING. ESTABLISHED 1867. AMERICAN BUREAU OF SHIPPING, NEW YORK. PUBLISHED BY

Has authorized agents in all the Principal Ports of the world to protect the interests of its patrons.

Vessels built under its rules or holding certificates of class or seaworthiness in this Record of Shipping will, with their cargoes, insure at the lowest rates.

**Office, 66-68 Beaver Street, New York**

# ST. JOHN PACKING WILL MAKE YOUR PISTON STEAM TIGHT



**CYLINDERS REBORED WITH PORTABLE TOOLS**

**E. J. ROOKSBY & CO.**

**1046 RIDGE AVE. PHILA., PA.**

# "DURABLE" WIRE ROPE

***FOR MOORING, TOWING HAWSERS, SHIP'S RIGGING, AND SIMILAR PURPOSES***

This wire rope is made of selected steel, and each strand is separately served with a specially prepared hemp marline.

It combines the pliability and wearing surface of hemp or Manilla ropes with the strength of ordinary wire rope, avoiding the disadvantages of both, and being far more **durable** and economical than either.

Full detailed information upon application.

**DURABLE WIRE ROPE CO.**

**93 PEARL STREET, BOSTON, MASS.**

# Detail Drawings

of a

## Four Furnace Single End Scotch Boiler

together with

## Diagrammatic Pipe and Auxiliary Plan

used in connection with a

## 1250 H.P. TRIPLE EXPANSION ENGINE

WITH KEY

Naming and Describing Every Part of the Engine.

***Price, $1.00 Postpaid***

**INTERNATIONAL MARINE ENGINEERING**

17 Battery Place, NEW YORK CITY

31 Christopher Street, Finsbury Square, London, E. C.

THIRD EDITION OF

# PRACTICAL MARINE ENGINEERING

with additional chapters on

**Internal Combustion Engines**
**Steam Turbines Oil Fuel**
**Marine Producer Gas Plants**

This book is written for

**MARINE ENGINEERS AND STUDENTS**

IT is devoted exclusively to the practical side of Marine Engineering and is especially intended for operative engineers and students of the subject generally, and particularly for those who are preparing for examinations for Marine Engineers' licenses for any and all grades.

**PART I.**—Covers the practical side of the subject, giving a great deal of detail regarding marine engines and all that appertains to them, together with much information regarding auxiliaries.

**PART II.**—Covers the general subject of calculations for marine engineers, and furnishes assistance in mathematics to those who may require such aid.

**PART III.**—Covers the latest and best practice in Internal Combustion Engines, Steam Turbines, Oil Fuel and Marine Producer Gas Plants.

The book is illustrated with nearly *four hundred and fifty diagrams and cuts* made especially for the purpose, and showing the most approved practice in the different branches of the subject. The text is in such plain, simple language that any man with an ordinary education can easily understand it.

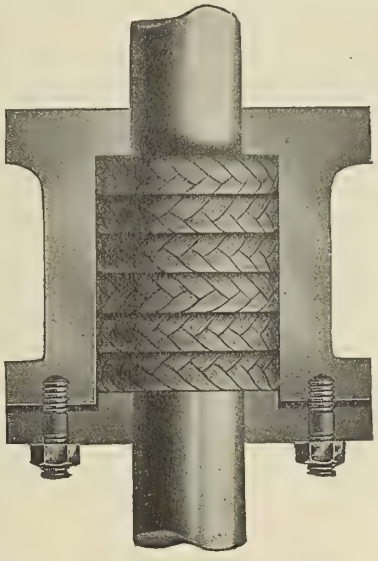
**Price, $5.00 (21/-)**

FOR SALE BY

**International Marine Engineering**

**17 Battery Place, New York, U. S. A.**
**31 Christopher St. Finsbury Square, E. C., London**

## DUVAL METALLIC PACKING



is a woven packing made of fine white alloy wire accurately plaited in square form. It is especially adapted for superheated steam and high pressure steam and water.

Easily first among packings, as are

**FOSTER SUPERHEATERS**

among superheaters.

**POWER SPECIALTY COMPANY**

NEW YORK BOSTON
CHICAGO PHILADELPHIA SAN FRANCISCO

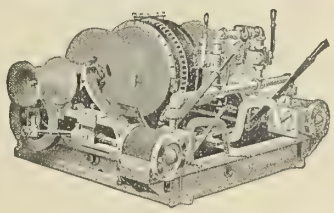
## CARELS FRÈRES
**GHENT, BELGIUM**

BUILDERS OF

**Carels Marine Oil Engines**
**300 to 6000 H. P.**

**W. R. HAYNIE,** U. S. REPRÉSENTATIVE
**30 Church Street New York**

## LIDGERWOOD
SHIPS WINCHES and STEERING ENGINES



IMPROVED DESIGNS
Built on duplicate part system
STANDARD WOOD & IRON
Friction Winch
WITH IMPROVED LEVER ARRANGEMENT

More than 34,000 engines and electric hoists in use

LIDGERWOOD MFG. CO., 96 Liberty St., NEW YORK

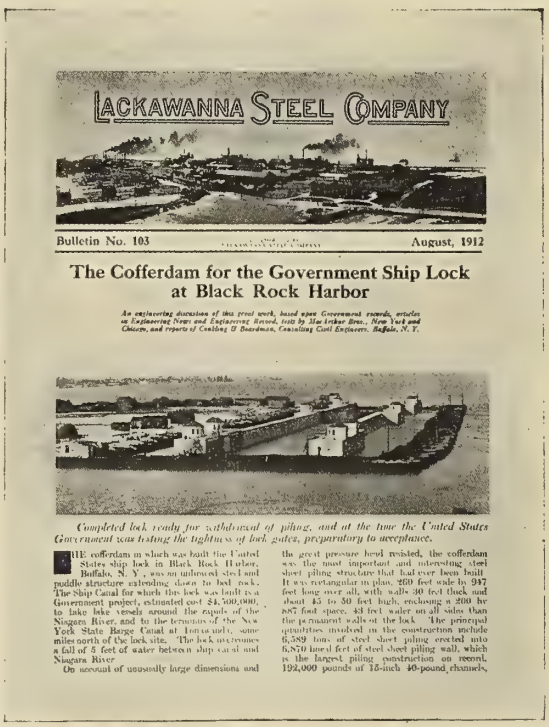
*Completed lock ready for withdrawal of piling and at the time the United States Government was testing the tightness of lock gates preparatory to acceptance.*

# BULLETIN No. 103 NOW READY!

## "The Cofferdam for the Government Ship Lock at Black Rock Harbor"

This bulletin on the greatest steel sheet piling work ever undertaken, describes in minute details every stage of the cofferdam work, from the preliminary piling tests to the pulling of the piling after the completion of the lock. The engineering features of this work as discussed herein offer interesting and useful hints to every engineer or contractor who may have occasion to use steel sheet piling. The chapters containing reports on installation and tensile tests under government supervision further show conclusively why *Lackawanna Steel Sheet Piling* enjoys unquestioned supremacy where great strength and easy driving are essentials.

Altogether, this bulletin is important enough to warrant most careful reading, so send your address for a free copy.


LACKAWANNA STEEL COMPANY

Bulletin No. 103 August, 1912

The Cofferdam for the Government Ship Lock at Black Rock Harbor

*An engineering discussion of this great work, based upon Government records, articles on Engineering News and Engineering Record, text by Max Arthur Bros., New York and Chicago, and reports of Cushing & Boardman, Consulting Civil Engineers, Buffalo, N. Y.*

*Completed lock ready for withdrawal of piling, and at the time the United States Government was testing the tightness of lock gates, preparatory to acceptance.*

THE cofferdam in which was built the United States ship lock in Black Rock Harbor, Buffalo, N. Y., was an unbraced steel and puddle structure extending about to bed rock. The Ship Canal for which the lock was built is a Government project, estimated cost $4,500,000, to take lake vessels around the rapids of the Niagara River, and to the terminus of the New York State Barge Canal at Tonawanda, some miles north of the lock site. The lock overcomes a fall of 5 feet of water between ship canal and Niagara River.

On account of unusually large dimensions and the great pressure head resisted, the cofferdam was the most important and interesting steel sheet piling structure that had ever been built. It was rectangular in plan, 260 feet wide by 947 feet long over all, with walls 30 feet thick and about 45 to 50 feet high, enclosing a 200 by 887 foot space, 43 feet water on all sides than the permanent walls of the lock. The principal quantities involved in the construction include 6,589 tons of steel sheet piling erected into 5,870 lineal feet of steel sheet piling wall, which is the largest piling construction on record, 192,000 pounds of 15-inch 40-pound channels,

# LACKAWANNA STEEL COMPANY

**General Sales Office and Works: Lackawanna, N. Y.**

NEW YORK BOSTON BUFFALO PHILADELPHIA PITTSBURGH CLEVELAND CINCINNATI CHICAGO DETROIT ST. LOUIS ATLANTA SAN FRANCISCO

38

## BUYERS' DIRECTORY

ACCESSORIES, BOAT—See BOAT ACCESSORIES.

ACETYLENE LIGHTING SYSTEMS.
Milburn, Alex. C., Co., Baltimore, Md.

ACCUMULATORS, HYDRAULIC.
Niles-Bement-Pond Co., New York.

AIR AND CIRCULATING PUMPS (Combined).
Davidson, M. T., Co., New York.
Wheeler Condenser and Engineering Co., Carteret, N. J.

AIR COMPRESSORS.
Independent Pneumatic Tool Co., Chicago and New York.
Norwalk Iron Works, South Norwalk, Conn.

AIR COOLERS.
Power Specialty Co., New York.
Schutte & Körting Co., Philadelphia, Pa.

AIR COUPLINGS.
Independent Pneumatic Tool Co., Chicago and New York.
National Tube Co., Pittsburg, Pa.

AIR DRILLS.
Independent Pneumatic Tool Co., Chicago and New York.
Norwalk Iron Works, South Norwalk, Conn.
Wheeler Condenser and Engineering Co., Carteret, N. J.

AIR HAMMERS—See PNEUMATIC TOOLS.

AIR HOISTS.
Independent Pneumatic Tool Co., Chicago and New York.

AIR HOSE.
Independent Pneumatic Tool Co., Chicago and New York.

AIR MOTORS.
Independent Pneumatic Tool Co., Chicago and New York.

AIR PUMPS.
Alberger Pump and Condenser Co., New York.
Davidson, M. T., Co., New York.
Wheeler Condenser and Engineering Co., Carteret, N. J.

ALARMS—See WATER GAUGES AND ALARMS.

ALCOHOL ENGINES.
Mietz, A., New York.

ALLOYS, VANADIUM.
American Vanadium Co., Pittsburg, Pa.

ALUMINUM CASTINGS.
Lunkenheimer Co., Cincinnati, Ohio.

ALUMINO VANADIUM.
American Vanadium Co., Pittsburg, Pa.

AMMETERS—See ELECTRICAL INSTRUMENTS.

AMMONIA PACKING.
Ferdinand, L. W., & Co., Boston, Mass.

AMMONIA PROOF HELMETS.
Hayward, S. F., & Co., New York.

ANCHORS.
American Engineering Co., Philadelphia, Pa.
Baldt Anchor Co., Chester, Pa.

ANCHOR TRIPPERS.
American Engineering Co., Philadelphia, Pa.

ANTI-CORROSIVE PAINT.
Toch Bros. New York.

ANTI-FRICTION METAL.
Biddle Hardware Co., Philadelphia, Pa.
Hyde Windlass Co., Bath, Maine.
Katzenstein, L., & Co., New York.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.

ANTI-RUST COATINGS.
Ferdinand, L. W., & Co., Boston, Mass.

APPARATUS (MARINE GLUE MELTING).
Ferdinand, L. W., & Co., Boston, Mass.

ASBESTOS—See NON-CONDUCTING COVERING; also see PACKING, ASBESTOS.

ASBESTOS PACKING—See PACKING, ASBESTOS.

ASH HOISTS.
American Engineering Co., Philadelphia, Pa.
Davidson, M. T., Co., New York.
Hyde Windlass Co., Bath, Maine.

ATTORNEYS—PATENT.
Decker, Delbert H., Washington, D. C.

AUTOMATIC INJECTORS.
Lunkenheimer Co., Cincinnati, Ohio.

AUTOMATIC TOWING MACHINES—See TOWING MACHINES.

AUTOMATIC WATER GAUGES—See WATER GAUGES.

BABBITT METAL—See ANTI-FRICTION METAL.

BALL BEARINGS—See THRUST BEARINGS.

BARGES—See SHIPBUILDERS.


**Monel Metal rods and sheets are shipped promptly from stock by the Biddle Hardware Company. Castings quickly furnished from customers' patterns.**

MONEL METAL

**Gives Lasting Service where Other Metals are Eaten Away**

The extreme resistance to corrosion demonstrated by Monel Metal makes it one of the most valuable materials the industrial world has ever known.

Monel Metal has the strength of steel and a finish like pure nickel. It is impervious to rust, acid conditions, gases, superheated steam and other corroding influences which quickly destroy steel or bronze. Monel Metal, by official test, has a tensile strength of 70,000 to 100,000 pounds per square inch.

Rods, sheets, castings and forgings of this wonderful alloy are saving big sums yearly for large business concerns, in reducing corrosion expense. For marine construction work, battleship propellers, etc., the metal is extensively used by the United States Navy.

Monel Metal is a *natural* alloy—sixty-eight per cent. nickel, twenty-seven per cent. copper, and the remainder iron and manganese. It outlasts bronze by 50 to 100 per cent., and is particularly valuable for pump rods, pump linings, centrifugal pump impellers and superheated steam valves.

Write us for catalog containing complete information on Monel Metal. We carry all sizes of sheets and rods and can fill your orders immediately from our immense stock.

**Engineers and naval architects wishing our stock list should be on our monthly mailing list. Send us your name and address.**

**Biddle Hardware Company**
DISTRIBUTORS
Established 1837
**512 Commerce St., Philadelphia**
150 Chambers Street, New York
BRANCH OFFICES
London Stockholm Montreal Buffalo

# Milburn Acetylene Apparatus

FOR MARINE USE

Portable Acetylene Lights

Oxy-Acetylene Welding and Cutting Plants

The Steam Acetylene Generator

SEND FOR CATALOGUE

GUARANTEE

All Milburn Apparatus is fully guaranteed and shipped subject to absolute satisfaction or it can be returned.

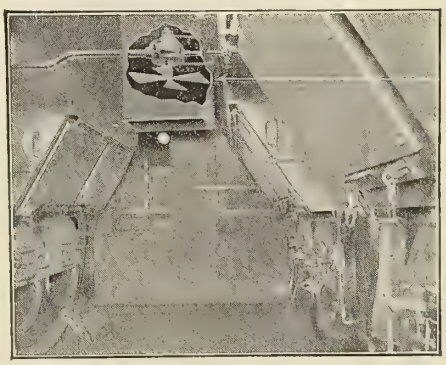
The Alexander C. Milburn Co.

1420-26 West Baltimore St.

BALTIMORE, MD.



# The B. B. Steam Turbine Ventilator



Method of installation in ventilating pipe leading to firehold.

Adaptable to steamers of all descriptions, from small yachts to ocean liners.

Particularly valuable for ventilating

| | |
|---|---|
| FIRE-HOLDS | KITCHENS |
| CARGO HOLDS | CABINS |
| ENGINE ROOMS | CREW QUARTERS |

in fact, anywhere where fresh, cool air is required at all times.

Can be used directly in stack or breaching for forced draft—not affected by heat, smoke or cinders.

*Write for Particulars*

**Bryant-Bery Steam Turbine Co.,** Detroit, Mich., U. S. A.


BATH TUBS—ENAMELED IRON, PORCELAIN.
Sands, A. B., & Son Co., New York.

BEARINGS—See ANTI-FRICTION METAL; also THRUST BEARINGS.

BELLS.
Hayward, S. F., & Co., New York.
National Tube Co., Pittsburg, Pa.

BELTING—See RUBBER BELTING.

BENCH TOOLS.
Starrett, L. S., Co., Athol, Mass.
Williams & Co., J. H., Brooklyn, N. Y.

BENDING MACHINES, KEEL PLATE OR GARBOARD.
Niles-Bement-Pond Co., New York.

BENDING ROLLS—See ROLLS.

BILGE PUMPS—See PUMPS.

BITTS.
American Engineering Co., Philadelphia, Pa.
Hyde Windlass Co., Bath, Maine.

BLOWERS.
American Blower Co., Detroit, Mich.
Bryant-Bery Steam Turbine Co., Detroit, Mich.
De Laval Steam Turbine Co., Trenton, N. J.
General Electric Co., Schenectady, N. Y.
Kerr Turbine Co., Wellsville, N. Y.
Sirocco Engineering Co.—See American Blower Co.
Sturtevant Co., B. F., Hyde Park, Mass.
Terry Steam Turbine Co., Hartford, Conn.

BLOW-OFF VALVES—See VALVES.

BLOWERS, SOOT—See SOOT BLOWERS.

BOAT ACCESSORIES.
Ferdinand, L. W., & Co., Boston, Mass.
Welin Marine Equipment Co., Long Island City, N. Y.

BOAT BUILDERS—See LAUNCHES AND YACHTS.

BOAT DAVITS—See DAVITS.

BOATS—See LIFE BOATS; also LAUNCHES AND YACHTS.

BOAT FITTINGS.
Ferdinand, L. W., & Co., Boston, Mass.
Welin Marine Equipment Co., Long Island City, N. Y.

BOILERS—Also see ENGINE BUILDERS—also SHIP BUILDERS.
Almy Water Tube Boiler Co., Providence, R. I.
Babcock & Wilcox Co., New York.
Bath Iron Works, Bath, Maine.
Griscom-Russell Co., New York.
Hyde Windlass Co., Bath, Maine.
Kingsford Foundry & Machine Works, Oswego, N. Y.
Mosher Water Tube Boiler Co., New York.
Robb Engineering Co., South Framingham, Mass.
Ward, Chas., Engineering Works, Charleston, W. Va.

BOILER CIRCULATORS.
Ross Schofield Co., New York.
Schutte & Körting Co., Philadelphia, Pa.

BOILER COMPOUNDS.
Johns-Manville, H. W., Co., New York.

BOILER COVERING—See NON-CONDUCTING COVERING.

BOILER FEEDERS—See FEED-WATER REGULATORS.

BOILER-FLUE AND TUBE CLEANERS.
Diamond Power Specialty Co., Detroit, Mich.
Griscom-Russell Co., New York.
Independent Pneumatic Tool Co., Chicago and New York.
Johns-Manville, H. W., Co., New York.

BOILER FLUE AND TUBE CUTTERS.
Griscom-Russell Co., New York.
Independent Pneumatic Tool Co., Chicago and New York.
Johns-Manville, H. W., Co., New York.

BOILER AND PIPE COVERINGS—See NON-CONDUCTING COVERING.

BOILER RIVETS—Also see RIVETS.
Champion Rivet Co., Cleveland, Ohio.

BOILER ROOM FITTINGS.
American Blower Co., Detroit, Mich.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Ashton Valve Co., Boston, Mass.
Diamond Power Specialty Co., Detroit, Mich.
Griscom-Russell Co., New York.
Jerguson Gage & Valve Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
Lytton Mfg. Corp., Franklin, Va.
McNab & Harlin Mfg. Co., New York.
National Tube Co., Pittsburg, Pa.
Powell, Wm., Co., Cincinnati, Ohio.
Star Brass Mfg. Co., Boston, Mass.
Watertown Specialty Co., Watertown, N. Y.

# The WESTON SYNCHROSCOPE

Constitutes a very simple and absolutely *perfect solution* of problems involved in coupling alternating-current machines in parallel without danger or sensible disturbance of circuit conditions.

*The indications are infallible.*

*There is only one object to observe.*

*The movement of the pointer is smooth and certain; it inspires confidence.*

*It indicates exact synchronism* within 1 deg. of true phase coincidence over a wide range of frequency and voltage.

Send for catalog giving full *description of this unique instrument* and also our full line of A. C. and D. C. instruments for Switchboard, Portable and Laboratory Work.

Demonstrations of the operative characteristics of these remarkable instruments may be observed in our New York Office and also in the offices of Selling Representatives in Philadelphia, Chicago, San Francisco and Toronto.

**WESTON ELECTRICAL INSTRUMENT COMPANY**
**Main Office and Works, NEWARK, N. J.**

**New York,** 114 Liberty St.
**Chicago,** 1504 Monadnock Block
**Boston,** 176 Federal St.
**Philadelphia,** 342 Mint Arcade
**Birmingham,** Brown Marx Bldg.
**Detroit,** 44 Buhl Block
**St. Louis,** 915 Olive St.
**Denver,** 231 15th St.
**San Francisco,** 682 Mission St.
**New Haven,** 29 College St.
**Cleveland,** 1729 E. 12th St.
**Toronto,** 76 Bay St.
**Montreal**, **Winnipeg**, **Vancouver**, **Calgary** } Northern Electric & Mfg. Co.
**London,** Audrey House, Ely Place, Holborn
**Paris,** 12 Rue St. Georges
**Berlin,** Genest Str. 5, Schoenberg
**Johannesburg, So. Africa,** F. Peabody Rice, Standard Bank Bldgs. Harrison St.

2


BOILER STAYBOLTS—See STAYBOLTS.

BOILER TUBES.
National Tube Co., Pittsburg, Pa.

BOILER TUBE CUTTERS—See BOILER FLUE AND TUBE CUTTERS.

BOILER TUBE RETARDERS.
Griscom-Russell Co., New York.

BOLTS AND NUTS.
National Tube Co., Pittsburg, Pa.

BOOKS.
Co-operative Publishing Co., Baltimore, Md.

BORING BARS—See CYLINDER BORING BARS.

BORING MACHINES—METAL WORKING.
Niles-Bement-Pond Co., New York.

BORING MACHINES—WOOD.
Independent Pneumatic Tool Co., Chicago and New York.

BORING AND TURNING MILLS.
Niles-Bement-Pond Co., New York.

BRASS AND COPPER—Also see YELLOW METAL; also MUNTZ METAL.
Biddle Hardware Co., Philadelphia, Pa.

BRASS CASTINGS.
Griscom-Russell Co., New York.
Hyde Windlass Co., Bath, Maine.
Lunkenheimer Co., Cincinnati, Ohio.

BRASS FITTINGS.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Biddle Hardware Co., Philadelphia, Pa.
McNab & Harlin Mfg. Co., New York.
National Tube Co., Pittsburg, Pa.
Powell Co., Wm., Cincinnati, Ohio.
Star Brass Mfg. Co., Boston, Mass.

BRAZING MATERIALS.
Smooth-On Mfg. Co., Jersey City, N. J.

BRONZE.
Lunkenheimer Co., Cincinnati, Ohio.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.

BRONZE CASTINGS—See CASTINGS, BRONZE.

BRONZE-VANADIUM.
American Vanadium Co., Pittsburg, Pa.

BUOYS.
Milburn, Alex. C., Co., Baltimore, Md.
Sands, A. B., & Son Co., New York.

BUOYS, LIGHT—See LIGHT BUOYS.

BUOYS, RING.
Ferdinand, L. W., & Co., Boston, Mass.

BURNERS, FUEL OIL—See FUEL OIL BURNERS.

BUSHINGS.
National Tube Co., Pittsburg, Pa.

BUTTERFLY VALVES—See VALVES.

BY-PASS VALVES—See VALVES.

CABLES—See CHAIN, also ROPE.

CABLEWAYS—See MARINE CABLEWAYS.

CALORIMETERS—SEPARATING, THROTTLING, COAL.
Schutte & Körting Co., Philadelphia, Pa.

CANOE GLUE.
Ferdinand, L. W., & Co., Boston, Mass.

CANVAS—WATERPROOF.
Wilford Cloth Co., New York.

CAPSTANS—STEAM—ELECTRIC—HAND.
American Engineering Co., Philadelphia, Pa.
Hyde Windlass Co., Bath, Maine.

CARGO BLOCKS—See BLOCKS.

CASTINGS—BRONZE—Also see STEEL CASTINGS.
Griscom-Russell Co., New York.
Hyde Windlass Co., Bath, Maine.
Lunkenheimer Co., Cincinnati, Ohio.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.

CAST-IRON VANADIUM.
American Vanadium Co., Pittsburg, Pa.

CAST-STEEL VANADIUM.
American Vanadium Co., Pittsburg, Pa.

CEMENT-ASBESTOS.
Johns-Manville, H. W., Co., New York.

CEMENT-LINOLEUM.
Ferdinand, L. W., & Co., Boston, Mass.

CENTRIFUGAL PUMPS—See PUMPS.

CHAIN.
Standard Chain Co., Pittsburg, Pa.

**90,000 Cubic Feet of Air every 60 Seconds**

delivered by three 30-inch diameter double inlet

"Sirocco" Fans

TRADE MARK.

against a 3-inch static pressure.

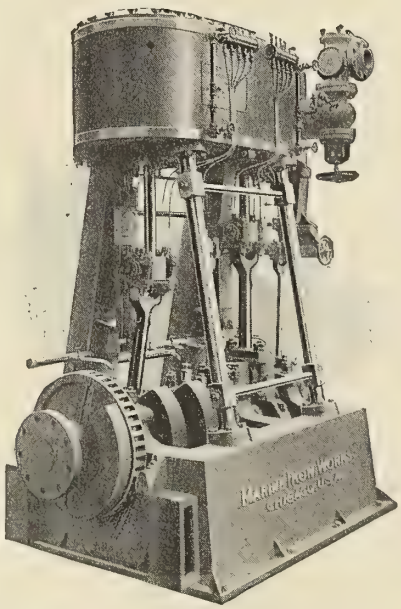
"Sirocco" Fan delivers more air at less expense for power than the ordinary steel plate fan twice the size.

*Bulletin No. 340-ME is a reference book on "Sirocco." Let us mail one to you.*

AMERICAN BLOWER COMPANY
DETROIT, MICH.
U. S. A.

CANADIAN SIROCCO COMPANY, LIMITED
Windsor, Ontario — Manufacturers for Canada

**Engine Operating Centrifugal Pump on Dredge in Cuba**



**Engines for Dredge Work in Triple Expansion, Compound and Double High Pressure**

**Also complete line of Steamboat Machinery**

*When in need of Marine Machinery built right for economy and power, write*

**MARINE IRON WORKS**
**2036 Dominick St., Chicago**
**Marine Machinery Specialists**

CHAIN PIPE WRENCHES—See WRENCHES.

CHAIN STOPPERS.
American Engineering Co., Philadelphia, Pa.

CHANDLERY STORES.
Biddle Hardware Co., Philadelphia, Pa.
Ferdinand, L. W., & Co., Boston, Mass.
Griscom-Russell Co., New York.

CHECK VALVES—See VALVES.

CHRONOMETERS—See CLOCKS.

CHOCKS.
American Engineering Co., Philadelphia, Pa.

CHUCKS.
Morse Twist Drill & Machine Co., New Bedford, Mass.

CIRCULATING PUMPS—See PUMPS.

CIRCULATORS—See BOILER CIRCULATORS.

CLASSIFICATION ASSOCIATION.
American Bureau of Shipping, New York.

CLOCKS.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Ashton Valve Co., Boston, Mass.
Star Brass Mfg. Co., Boston, Mass.

COAL.
Pocahontas Fuel Co., New York.

COATINGS, ANTI-RUST—See ANTI-RUST COATINGS.

COCKS—See GAUGE COCKS.

COAL HANDLING MACHINERY.
Lidgerwood Mfg. Co., New York.

COLLECTORS—PNEUMATIC.
Sturtevant Co., B. F., Hyde Park, Mass.

COMPANION FLANGES.
Lunkenheimer Co., Cincinnati, Ohio.
National Tube Co., Pittsburg, Pa.

COMPOUNDS—See BOILER COMPOUNDS.

CONDENSERS.
Alberger Pump and Condenser Co., New York.
American Engineering Co., Philadelphia, Pa.
Davidson, M. T., Co., New York.
Griscom-Russell Co., New York.
Schutte & Körting Co., Philadelphia, Pa.
Wheeler Condenser and Engineering Co., Carteret, N. J.

CONSULTING ENGINEERS—See ENGINEERS—Also PROFESSIONAL CARDS.

CONVEYING MACHINERY.
Lidgerwood Mfg. Co., New York.
Sturtevant Co., B. F., Hyde Park, Mass.

COOLERS, AIR—See AIR COOLERS.

COOLERS FOR OIL.
Schutte & Körting Co., Philadelphia, Pa.

COPPER—See BRASS AND COPPER.

CORDAGE—Also see ROPE and WIRE ROPE—Also TWINE.
Columbian Rope Co., Auburn, N. Y.
Durable Wire Rope Co., Boston, Mass.
Griscom-Russell Co., New York.
Plymouth Cordage Co., North Plymouth, Mass.

CORK CEMENT, FENDERS, JACKETS, RINGS.
Ferdinand, L. W., & Co., Boston, Mass.

CORRUGATED FURNACES.
Continental Iron Works, Brooklyn, N. Y.

COTTON DUCK—See CHANDLERY STORES.

COTTON RUBBER-LINED HOSE—See HOSE.

COUNTERS—See REVOLUTION COUNTERS.

COVERING, STEAM—See NON-CONDUCTING COVERING.

CRANES.
American Engineering Co., Philadelphia, Pa.
Niles-Bement-Pond Co., New York.
Welin Marine Equipment Co., Long Island City, N. Y.

CRANK SHAFTS—See FORGINGS.

CUPRO-VANADIUM.
American Vanadium Co., Pittsburg, Pa.

CUTTERS.
Morse Twist Drill & Machine Co., New Bedford, Mass.

CYLINDER BORING BARS.
Niles-Bement-Pond Co., New York.

CYLINDER RELIEF VALVES—See VALVES.

CYLINDERS FOR COMPRESSED AIR, GAS, ETC.
National Tube Co., Pittsburg, Pa.

CYLINDERS, VANADIUM.
American Vanadium Co., Pittsburg, Pa.

DAMPER REGULATORS.
Diamond Power Specialty Co., Detroit, Mich.

**DAVITS.**
Welin Marine Equipment Co., Long Island City, N. Y.

**DECK HOISTS—See HOISTING ENGINES.**

**DECK PLATES.**
Sands, A. B., & Son Co., New York.

**DECK PUMPS—See PUMPS.**

**DIAPHRAGM PUMPS—See PUMPS.**
Hyde Windlass Co., Bath, Maine.

**DIES.**
Morse Twist Drill & Machine Co., New Bedford, Mass.

DIESEL ENGINES.
Carels Frères, Ghent, Belgium; and New York.

**DIRECT-CONNECTED SETS—See ELECTRICAL PLANTS.**

**DISENGAGING GEARS.**
Welin Marine Equipment Co., Long Island City, N. Y.

**DISTILLERS—See EVAPORATORS.**

**DIVING APPARATUS.**
Morse, Andrew J., & Son, Inc., Boston, Mass.

**DRAFT, MECHANICAL—See MECHANICAL DRAFT.**

DRAFTING INSTRUMENTS.
Starrett, L. S., Co., Athol, Mass.

**DRAIN VALVES—See VALVES.**

DREDGE BUCKETS.
Atkinson-Frizelle Co., Hoboken, N. J.

DREDGING MACHINERY.
Alberger Pump and Condenser Co., New York.
American Engineering Co., Philadelphia, Pa.
Atkinson-Frizelle Co., Hoboken, N. J.

**DRILLING MACHINES, VERTICAL, HORIZONTAL AND RADIAL.**
Niles-Bement-Pond Co., New York.

**DRILLS.**
Morse Twist Drill & Machine Co., New Bedford, Mass.

**DRILLS, ELECTRIC—See ELECTRIC DRILLS.**

**DRILLS, PNEUMATIC—See PNEUMATIC TOOLS—Also AIR DRILLS.**

**DRILLS, PORTABLE—See PORTABLE DRILLS.**

**DROP FORGINGS—EYE BOLTS, HOOKS, ROPE SOCKETS, WRENCHES, ETC.**
Sizer Forge Co., Buffalo, N. Y.
Williams & Co., J. H., Brooklyn, N. Y.

**DROP HAMMERS.**
Niles-Bement-Pond Co., New York.

**DRY DOCKS AND MARINE RAILWAYS.**
Krajewski-Pesant Corporation, Havana, Cuba.
Merrill-Stevens Co., Jacksonville Fla.
Newport News Shipbuilding & Dry Dock Co., Newport News, Va.
Tietjen & Lang Dry Dock Co., Hoboken, N. J.

**DRY DOCKS—MARINE RAILWAY—MANUFACTURER.**
Crandall Engineering Co., The, East Boston, Mass.

**DRYING APPARATUS.**
American Blower Co., Detroit, Mich.
Sturtevant Co., B. F., Hyde Park, Mass.

**DYNAMOS—See ELECTRIC PLANTS; also STEAM TURBINE DYNAMOS.**

**ECONOMIZERS, FUEL—See FUEL ECONOMIZERS.**

**EJECTORS.**
Lunkenheimer Co., Cincinnati, Ohio.
Schutte & Körting Co., Philadelphia, Pa.

ELECTRIC DRILLS.
General Electric Co., Schenectady, N. Y.
Independent Pneumatic Tool Co., Chicago and New York.
Johns-Manville, H. W., Co., New York.

ELECTRIC HEATERS.
General Electric Co., Schenectady, N. Y.
Simplex Electric Heating Co., Cambridgeport, Mass.

ELECTRIC HOISTS.
American Engineering Co., Philadelphia, Pa.
General Electric Co., Schenectady, N. Y.
Hyde Windlass Co., Bath, Maine.
Lidgerwood Mfg. Co., New York.
Niles-Bement-Pond Co., New York.

ELECTRIC LIGHTS.
General Electric Co., Schenectady, N. Y.

**ELECTRIC PLANTS.**
General Electric Co., Schenectady, N. Y.
Sturtevant Co., B. F., Hyde Park, Mass.
Terry Steam Turbine Co., Hartford, Conn.


**Thor CLOSE CORNER PISTON AIR DRILLS**
**THE ORIGINAL Nos. 8 and 9 DRILLS**

Equipped with Roller Bearings.

Guaranteed 30% more efficient than any other make.

*Sent on trial.*

Write for circular Q giving latest information regarding *Thor Air Tools.*

**INDEPENDENT PNEUMATIC TOOL CO.**
Chicago New York Pittsburgh Atlanta San Francisco

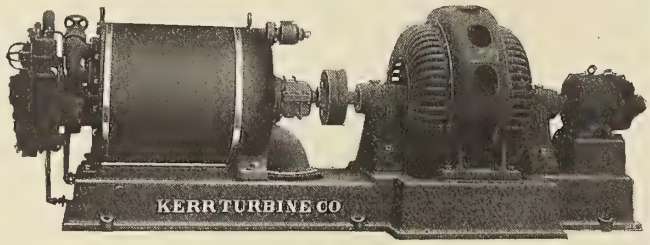
**TEAK for Ship and Yacht Work**
in Logs and Flitches
We also make a specialty of converting net sizes in large or small orders.
**Mahogany and Hardwoods**
For Interior Finish
**S. B. VROOMAN CO., LTD.**
1133-1141 BEACH STREET, PHILADELPHIA, PA.

**WILLIAMSON ELECTRIC STEERING GEARS**
Direct-connected to Rudder by Screw Gear or Tiller Gear
This type is now being furnished for the new dreadnought battleship **TEXAS.**
Fully 80 per cent of all steering engines on ships under the American Flag were built by us.
**AMERICAN ENGINEERING CO.**
Machinists and Founders
Philadelphia, Pa. 15-327

**EUREKA FIRE HOSE**
*Awarded Gold Medal at the St. Louis Exposition for Superiority of Our Goods*

TRADE-MARK.

SAFEST AND BEST
FULLY TESTED AND MADE TO LAST
"A word to the wise is sufficient"
Seamless Woven and Rubber-Lined
EUREKA FIRE HOSE
"PARAGON" BRAND Has No Equal
*SEND FOR SAMPLE*
**EUREKA FIRE HOSE MFG. CO.**
New York, N. Y.; Boston, Mass.; Chicago, Ill.; Philadelphia, Pa.; Columbus, Ohio; Atlanta, Ga.; Dallas, Texas; Minneapolis, Minn.; Denver, Colo.; Seattle, Wash.; Syracuse, N. Y. Kansas City, Mo.; Detroit, Mich.; Omaha, Neb.; San Francisco, Cal.




## "We simply oil it up once in a while and let it run."

*"We take great pleasure in showing this machine as it has given us little or no expense. Certainly if we were to buy another turbine, we would buy yours."*
That's what the purchaser of one of our turbines said.

Here is another letter.
*"There has been no money spent for maintenance of the turbines and no money spent on attention. They are started by the oiler, bearings examined once every eight hours, and turbine looked over. Oil in the bearings is changed monthly, otherwise they take care of themselves."*

Certainly such evidence should be convincing. We have something like 900 other satisfactory installations in marine service and elsewhere to which we will gladly refer you. Tell us your conditions and requirements and perhaps we can tell you where Economy Turbines are doing similar work.

SEND FOR OUR BIG NEW CATALOG.

STEAM ECONOMY TURBINE

**KERR TURBINE CO.**
**Wellsville, N.Y.**

AGENTS IN ALL LARGE CITIES

51

# Marine Refrigerating and Ice Making Plants

## 135

vessels now equipped or being equipped with

BRUNSWICK

MARINE REFRIGERATING AND ICE MAKING PLANTS

Built for any vessel of any size.

For ship's stores or cargo cold stores.

**Write for List of Marine Installations**

**BRUNSWICK REFRIGERATING CO.**
**New Brunswick, New Jersey**


ELECTRICAL FITTINGS AND SUPPLIES—Also see ELECTRIC PLANTS.
General Electric Co., Schenectady, N. Y.
Griscom-Russell Co., New York.
Johns-Manville, H. W., Co., New York.

ELECTRICAL INSTRUMENTS.
General Electric Co., Schenectady, N. Y.
Weston Electrical Instrument Co., Waverly Park, Newark, N. J.

ELEVATORS, FREIGHT—See FREIGHT ELEVATORS, also INCLINED ELEVATORS.

ENGINE PACKING—See PACKING.

ENGINE-ROOM SUPPLIES—See STEAM SPECIALTIES.

ENGINEERS, CONSULTING AND CONTRACTORS.
American Engineering Co., Philadelphia, Pa.
Donnelly, W. T., New York.
Griscom-Russell Co., New York.

ENGINES FOR AUXILIARIES.
Alberger Pump and Condenser Co., New York.
American Blower Co., Detroit, Mich.
American Engineering Co., Philadelphia, Pa.
De Laval Steam Turbine Co., Trenton, N. J.
Hyde Windlass Co., Bath, Maine.
Kerr Turbine Co., Wellsville, N. Y.
Marine Iron Works, Chicago, Ill.
Sturtevant Co., B. F., Hyde Park, Mass.
Terry Steam Turbine Co., Hartford, Conn.
Wheeler Condenser and Engineering Co., Carteret, N. J.

ENGINES, GASOLINE—See GASOLINE ENGINES.

ENGINES, HOISTING—See HOISTING ENGINES.

ENGINES, KEROSENE—See KEROSENE ENGINES.

ENGINES, OIL—See also DIESEL ENGINES.
Carels Frères, Ghent, Belgium; and New York.
Mietz, A., New York.
Wolverine Motor Works, Bridgeport, Conn.

ENGINES—PROPELLING.
Bath Iron Works, Bath, Maine.
Carels Frères, Ghent, Belgium and New York.
Kingsford Foundry & Machine Works, Oswego N. Y.
Marine Iron Works, Chicago, Ill.
Mietz, A., New York.
Parsons Marine Steam Turbine Co., New York.
Sheriffs Mfg. Co., Milwaukee, Wis.
Trout, H. G., Co., Buffalo, N. Y.
Ward, Chas., Engineering Works, Charleston, W. Va.

ENGINE REGISTERS.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.

ENGINE-ROOM CLOCKS—See CLOCKS.

ESCALATORS.
Otis Elevator Co., New York.

EVAPORATORS.
Alberger Pump and Condenser Co., New York.
American Engineering Co., Philadelphia, Pa.
Davidson, M. T., Co., New York.
Griscom-Russell Co., New York.
Schutte & Körting Co., Philadelphia, Pa.
Wheeler Condenser and Engineering Co., Carteret, N. J.

EXCESS PUMP GOVERNORS—See PUMP GOVERNORS.

EXHAUST FANS—See BLOWERS.

EXHAUST HEADS.
Sturtevant Co., B. F., Hyde Park, Mass.

EXPANDERS—See BOILER FLUE AND TUBE EXPANDERS.

EXPANSION JOINTS.
Alberger Pump and Condenser Co., New York.
Griscom-Russell Co., New York.
Lunkenheimer Co., Cincinnati, Ohio.
National Tube Co., Pittsburg, Pa.
Power Specialty Co., New York.

FANS—See BLOWERS.

FEED CHECK VALVES—See VALVES.

FEED-WATER HEATERS AND PURIFIERS.
Alberger Pump and Condenser Co., New York.
American Engineering Co., Philadelphia, Pa.
Griscom-Russell Co., New York.
Schutte & Körting Co., Philadelphia, Pa.
Wheeler Condenser and Engineering Co., Carteret, N. J.

FEED-WATER REGULATORS.
Alberger Pump and Condenser Co., New York.
Jerguson Gage & Valve Co., Boston, Mass.

FERRO-VANADIUM.
American Vanadium Co., Pittsburg, Pa.

FERRY BOAT LAMPS—See LAMPS.

FILES.
Nicholson File Co., Providence, R. I.

FILTERS.
Griscom-Russell Co., New York.
Schutte & Körting Co., Philadelphia, Pa.

FIRE DEPARTMENT SUPPLIES.
Fumigating & Fire Extinguishing Co. of America, New York.
Hayward, S. F., & Co., New York.
Morse, Andrew J., & Son, Inc., Boston, Mass.

FIRE EXTINGUISHERS.
Fumigating & Fire Extinguishing Co. of America, New York.
Hayward, S. F., & Co., New York.
Morse, Andrew J., & Son, Inc., Boston, Mass.

FIRE HOSE—See HOSE.

FIREPROOF CONSTRUCTION.
Johns-Manville, H. W., Co., New York.

FIREPROOF LUMBER—See LUMBER, FIREPROOF.

FIRE PUMPS—See PUMPS.

FLANGES.
Dart, E. M., Mfg. Co., Providence, R. I.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
National Tube Co., Pittsburg, Pa.

FLANGING PRESSES.
Niles-Bement-Pond Co., New York.

FLEXIBLE SHAFTING.
Stow Mfg. Co., Binghamton, N. Y.

FLOATING DRY DOCKS—See DRY DOCKS.

FLUE CLEANERS—See BOILER FLUE CLEANERS.

FLUE CUTTERS—See BOILER FLUE AND TUBE CUTTERS.

FORCED DRAFT—See also BLOWERS.
American Blower Co. and Sirocco Engineering Co., Detroit, Mich.
De Laval Steam Turbine Co., Trenton, N. J.
General Electric Co., Schenectady, N. Y.
Sturtevant Co., B. F., Hyde Park, Mass.

FORGES.
Sturtevant Co., B. F., Hyde Park, Mass.

FORGINGS, BRONZE—See also DROP FORGINGS.
Atkinson-Frizelle Co., Hoboken, N. J.
Erie Forge Co., Erie, Pa.
Hyde Windlass Co., Bath, Me.
Sizer Forge Co., Buffalo, N. Y.
Vanadium Metals Co., Pittsburg, Pa.

FORGINGS, OPEN HEARTH STEEL.
Atkinson-Frizelle Co., Hoboken, N. J.
Erie Forge Co., Erie, Pa.
Sizer Forge Co., Buffalo, N. Y.

FORGINGS, VANADIUM.
American Vanadium Co., Pittsburg, Pa.
Atkinson-Frizelle Co., Hoboken, N. J.
Sizer Forge Co., Buffalo, N. Y.

FREIGHT ELEVATORS FOR DOCKS AND WHARVES.
Otis Elevator Co., New York.

FROSTPROOF COVERINGS.
Ferdinand, L. W., & Co., Boston, Mass.

FUEL ECONOMIZERS.
Griscom-Russell Co., New York.
Power Specialty Co., New York.
Sturtevant Co., B. F., Hyde Park, Mass.

FUEL OIL BURNERS.
Schutte & Körting Co., Philadelphia, Pa.

FURNACES—Also see CORRUGATED FURNACES.
Continental Iron Works, New York.

FUSIBLE PLUGS.
Griscom-Russell Co., New York.
Lunkenheimer Co., Cincinnati, Ohio.

GALLEYS—See RANGES.

GAS BLOWERS AND EXHAUSTERS.
American Blower Co., Detroit, Mich.
Schutte & Körting Co., Philadelphia, Pa.
Sturtevant Co., B. F., Hyde Park, Mass.

GASKETS—Also see PACKING.
Griscom-Russell Co., New York.
Johns-Manville, H. W., Co., New York.
Katzenstein & Co., L., New York.
New York Belting & Packing Co., Ltd., New York.
Peerless Rubber Mfg. Co., New York.
Power Specialty Co., New York.
Smooth-On Mfg. Co., Jersey City, N. J.

GASOLINE ENGINES—Also see LAUNCHES AND YACHTS: KEROSENE ENGINES; OIL ENGINES; DIESEL ENGINES.
Bridgeport Motor Co., Bridgeport, Conn.
Mietz, A., New York.
Standard Motor Construction Co., Jersey City, N. J.
Wolverine Motor Works, Bridgeport, Conn.

GAS ENGINE SPECIALTIES.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
Powell, Wm., Co., Cincinnati, Ohio.
Star Brass Mfg. Co., Boston, Mass.

GAS PRODUCERS—See MARINE GAS PRODUCERS.

GATE VALVES—See VALVES.

GAUGE COCKS.
American Steam Gauge and Valve Mfg. Co., Boston, Mass.
Jerguson Gage & Valve Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
National Tube Co., Pittsburg, Pa.
Powell, Wm., Co., Cincinnati, Ohio.
Star Brass Mfg. Co., Boston, Mass.

GAUGES—See STEAM GAUGES; also WATER GAUGES.


"Sands" Sanitary Fixtures
Insist on "SANDS" Standard

The "Iowa" Pump Water Closet has latest style Vitro Adamant Extra Heavy Oval Flushing Rim, Straight Back Hopper, Bowl fitted with 4-in. Supply and Waste Pump, fitted with our "Automatic Safety Supply Foot Valve" controlling water supply.

A new high grade fixture, suitable for owners', guests' or officers' staterooms.

Price with Quartered Oak, Cabinet Finish Seat and Cover, Pump Rough with Polished Trimmings

$85.00

KNOWN AND USED "'ROUND THE WORLD"

"IOWA" PLATE S-2040
(Patented---Copyrighted)

Send for *CATALOGUE "E"* showing large assortment of *Marine Plumbing Fixtures and Specialties*, free upon application.

A. B. SANDS & SON COMPANY
1849 "Pioneers for Over 60 Years" 1912
Largest Manufacturers in the World of
*MARINE PLUMBING SPECIALTIES*
22-24 Vesey St., New York, U.S.A.

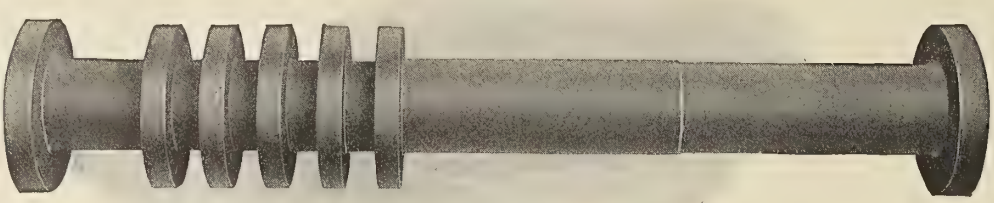
Without a Pump or Other Device the
ROBB-BRADY
SCOTCH BOILER
GIVES RAPID CIRCULATION
Ask for Bulletin "Circulation in Marine Boilers"
ROBB ENGINEERING COMPANY, Ltd.
SO. FRAMINGHAM, MASS. 39—1

Schuette Recording Compass Co.
Manitowoc, Wisconsin, U. S. A.

Our compasses will keep an accurate automatic record of how your ship is steering. They will show what course you were steering and the exact time when the course was changed.

*Write for Descriptive Booklet.*

AGENTS
WM. ROWEKAMP, Lappenbergsalle 4, Hamburg, Germany
TAKATA & CO., Tokio, Japan
JOHN BLISS & CO., 128 Front Street, New York, N. Y.
GEO. E. BUTLER, Alaska Com. Building, San Francisco, Cal.
COMPLETE INSTRUMENTS IN STOCK



OPEN HEARTH
and
ALLOY STEEL FORGINGS
OF QUALITY

Rough Turned
or
Finished Complete

ERIE FORGE CO. ERIE, PA., U.S.A. *Write us about your requirements*

Try the Nicholson next time you buy

NICHOLSON
U.S.A.

Nicholson File Co. Providence, R. I.

GAUGE GLASSES.
Jerguson Gage & Valve Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
Watertown Specialty Co., Watertown, N. Y.

GAUGE TESTERS.
American Steam Gauge and Valve Mfg. Co., Boston, Mass.

GEARS, VANADIUM.
American Vanadium Co., Pittsburg, Pa.

GENERATORS—See ELECTRIC PLANTS.

GLOBE VALVES—See VALVES.

GLUE—LINOLEUM, MARINE, SHIP, YACHT, WATERPROOF.
Ferdinand, L. W., & Co., Boston, Mass.

GONGS.
National Tube Co., Pittsburg, Pa.
Vanadium Metals Co., Pittsburg, Pa.

GOVERNORS—See PUMP GOVERNORS.

GRABS—See DREDGING MACHINES.

GRAPHITE.
Dixon, Jos., Crucible Co., Jersey City, N. J.

GRATE BARS.
Griscom-Russell Co., New York.

GREASE—See LUBRICANTS.

GREASE CUPS—See LUBRICATORS.
Albany Lubricating Co., New York.
Cook's Sons, Adam, New York.
Griscom-Russell Co., New York.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.

GREASE EXTRACTORS.
American Steam Gauge and Valve Mfg. Co., Boston, Mass.
Griscom-Russell Co., New York.

GYPSEYS.
American Engineering Co., Philadelphia, Pa.
Hyde Windlass Co., Bath, Maine.

HAMMERS, PNEUMATIC—See PNEUMATIC TOOLS.

HARDWARE—See MARINE HARDWARE; also CHANDLERY STORES.

HARDWOOD—See LUMBER.

HAWSERS—See WIRE ROPE.

HEATERS—BATH, LAVATORY, SHOWER.
Alberger Pump and Condenser Co., New York.
Sands, A. B., & Son Co., New York.
Schutte & Körting Co., Philadelphia, Pa.

HEATING AND VENTILATING APPARATUS.
American Blower Co., Detroit, Mich.
Schutte & Körting Co., Philadelphia, Pa.
Sturtevant Co., B. F., Hyde Park, Mass.

HELMETS, SMOKE AND AMMONIA.
Hayward, S. F., & Co., New York.

HEMP—See TWINE.

HOISTING ENGINES.
American Engineering Co., Philadelphia, Pa.
Hyde Windlass Co., Bath, Maine.
Lidgerwood Mfg. Co., New York.

HOISTS, CHAIN—See CHAIN HOISTS.

HOISTS, ELECTRIC—See ELECTRIC HOISTS.

HOSE—See AIR HOSE.
Eureka Fire Hose Mfg. Co., New York.
Hayward, S. F., & Co., New York.
Independent Pneumatic Tool Co., Chicago and New York.
New York Belting & Packing Co., Ltd., New York.

HOSE COUPLING.
Eureka Fire Hose Co., New York.
Hayward, S. F., & Co., New York.
Independent Pneumatic Tool Co., Chicago and New York.
McNab & Harlin Mfg. Co., New York.
National Tube Co., Pittsburg, Pa.

HOSE NOZZLES.
Hayward, S. F., & Co., New York.
McNab & Harlin Mfg. Co., New York.
Morse, Andrew J., Son, Inc., Boston, Mass.

HOSE REELS AND RACKS.
Hayward, S. F., & Co., New York.

HUMIDIFIERS.
Griscom-Russell Co., New York.
Tillotson Humidifier Co., Providence, R. I.

HYDRAULIC FITTINGS.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
National Tube Co., Pittsburg, Pa.
Powell, Wm., Co., Cincinnati, Ohio.
Schutte & Körting Co., Philadelphia, Pa.

HYDRAULIC MACHINERY—RIVETERS, PUNCHES, SHEARS.
Niles-Bement-Pond Co., New York.

ICE MACHINES—See REFRIGERATING PLANTS.

INCLINED ELEVATORS FOR DOCKS AND WHARVES.
Otis Elevator Co., New York.

INDICATOR CONNECTIONS.
Lunkenheimer Co., Cincinnati, Ohio.

INDICATORS—STEAM AND GAS ENGINE.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
Powell Co., The, Wm., Cincinnati, Ohio.
Star Brass Mfg. Co., Boston, Mass.

INDUCED DRAFT.
American Blower Co., Detroit, Mich.
Sturtevant Co., B. F., Hyde Park, Mass.

INJECTORS.
Lunkenheimer Co., Cincinnati, Ohio.
Powell Co., The, Wm., Cincinnati, Ohio.
Schutte & Körting Co., Philadelphia, Pa.

INSURANCE—MARINE AND FIRE.
Hutchinson, Rivinus & Co., New York and Philadelphia.

INTERLOCKING RUBBER TILING.
Griscom-Russell Co., New York.
New York Belting & Packing Co., Ltd., New York.

IRON CEMENT.
Smooth-On Mfg. Co., Jersey City, N. J.

JACKS—PNEUMATIC.
Independent Pneumatic Tool Co., Chicago and New York.

JOURNAL BEARINGS—See THRUST BEARINGS.

JUTE.
Columbian Rope Co., Auburn and New York.

KEROSENE ENGINES—See also OIL ENGINES AND DIESEL ENGINES.
Mietz, A., New York.
Wolverine Motor Works, Bridgeport, Conn.

LATHES, CRANK SHAFT.
Niles-Bement-Pond Co., New York.

LAMPS, SIGNALS, AND FIXTURES.
Carlisle & Finch Co., Cincinnati, Ohio.
General Electric Co., Schenectady, N. Y.
Johns-Manville, H. W., Co., New York.

LATHES, ENGINE.
Niles-Bement-Pond Co., New York.

LATHES, TURRET.
Niles-Bement-Pond Co., New York.

LAUNCHES AND YACHTS—See also SHIPBUILDERS AND DRY DOCK COMPANIES.
Bridgeport Motor Co., Bridgeport, Conn.
Marine Iron Works, Chicago, Ill.
Standard Motor Construction Co., Jersey City, N. J.
Ward, Chas., Engineering Works, Charleston, W. Va.
Welin Marine Equipment Co., Long Island City, N. Y.

LAVATORIES—FOLDING, STATIONARY, STATEROOM.
Sands, A. B., & Son Co., New York.

LAVATORY AND BATH HEATERS.
Griscom-Russell Co., New York.
Schutte & Körting Co., Philadelphia, Pa.

LIFE BOATS AND RAFTS.
Welin Marine Equipment Co., Long Island City, N. Y.

LIFE GUNS.
Hayward, S. F., & Co., New York.

LIFE PRESERVERS.
Ferdinand, L. W., & Co., Boston, Mass.
Welin Marine Equipment Co., Long Island City, N. Y.

LIFE-SAVING DEVICES.
Hayward, S. F., & Co., New York.
Welin Marine Equipment Co., Long Island City, N. Y.

LIGHTS.
Milburn, Alex. C., Co., Baltimore, Md.

LIGHT BUOYS.
Milburn, Alex. C., Co., Baltimore, Md.

LIGHTHOUSE APPARATUS.
Milburn, Alex. C., Co., Baltimore, Md.

LINOLEUM CEMENT.
Ferdinand, L. W., & Co., Boston, Mass.

LIQUID GLUE, WATERPROOF.
Ferdinand, L. W., & Co., Boston, Mass.

LOG REGISTERS.
Schuette Recording Compass Co., Manitowoc, Wis.
Welin Marine Equipment Co., Long Island City, N. Y.

LUBRICANTS.
Albany Lubricating Co., New York.
Cook's Sons, Adam, New York.
Dixon, Jos., Crucible Co., Jersey City, N. J.
Power Specialty Co., New York.

LUBRICATING COMPOUND.
Albany Lubricating Co., New York.
Cook's Sons, Adam, New York.

LUBRICATORS.
Albany Lubricating Co., New York.
Cook's Sons, Adam, New York.
Griscom-Russell Co., New York.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
Powell, Wm., Co., Cincinnati, Ohio.
Schutte & Körting Co., Philadelphia, Pa.

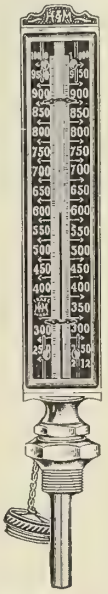
LUMBER.
Vrooman, S. B., Co., Philadelphia, Pa.

MACHINE TOOLS—See TOOLS, MACHINE.

MAHOGANY—See LUMBER.

MANGANESE BRONZE CASTINGS—Also see BRONZE.
Griscom-Russell Co., New York.
Hyde Windlass Co., Bath, Maine.
Lunkenheimer Co., Cincinnati, Ohio.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.

H&M
"Tycos"
THERMOMETERS
TELL THE TRUTH



We could reduce the cost of our Thermometers 40% and they would still look like the Navy Standard.

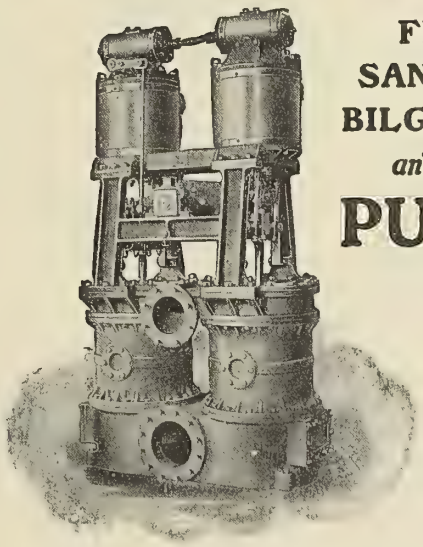
Made as we know they should be, they will outlive a Battleship.

This is why H&M Thermometers are the best made.

*Descriptive Catalog on request*

THE H&M DIVISION
*Taylor Instrument Companies*
ROCHESTER, N. Y.
NEW YORK BOSTON CHICAGO

DAVIDSON
PUMPS



FEED,
SANITARY,
BILGE, FIRE
*and* AIR
PUMPS

Condensers
Evaporators
Ash
Ejectors

M. T. DAVIDSON CO.
154 Nassau Street, NEW YORK

We are sole mfrs. of this simplest form of Safety Lathe Dog

We furnish to order the Safety form of Dog Forging with the Square Head Screw, but do not recommend the combination because it vitiates the Safety features of the tool.

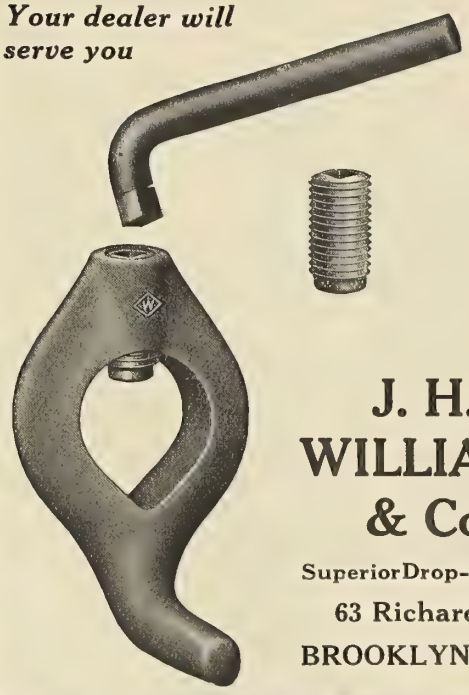
# "Vulcan" Safety Dogs

offer

Safety (in simplest form).
Better balance in Lathe.
Tempered headless screws.
Toughened Safety Dog Wrenches.

Same price as for dangerous and otherwise less desirable forms of tool.

*Your dealer will serve you*



J. H. WILLIAMS & Co.

Superior Drop-forgings

63 Richard St.

BROOKLYN, N. Y.

MAGNESIA COVERINGS.
**Johns-Manville, H. W., Co., New York.**

MANILA AND SISAL ROPE—See ROPE; also CORDAGE.

MARINE BOILER COMPOUNDS—See BOILER COMPOUNDS.

MARINE CABLEWAYS.
**Lidgerwood Mfg. Co., New York.**

MARINE ENGINES—See ENGINES, PROPELLING.

MARINE FORGINGS—See FORGINGS.

MARINE GAS PRODUCERS.
Griscom-Russell Co., New York.
**Marine Producer Gas Power Co., New York.**
Wolverine Motor Works, Bridgeport, Conn.

MARINE GLUE.
**Ferdinand, L. W., & Co., Boston, Mass.**

MARINE HARDWARE.
Griscom-Russell Co., New York.
Biddle Hardware Co., Philadelphia, Pa.
**Ferdinand, L. W., & Co., Boston, Mass.**

MARINE LAMPS—See LAMPS.

MARINE PAINT.
Toch Bros. New York.

MARINE RAILWAY BUILDERS—See RAILWAY DRY DOCKS.
Crandall Engineering Co., The, East Boston, Mass.

MARINE RANGES—See RANGES.

MARINE REFRIGERATION—See REFRIGERATING PLANTS.

MARINE SIGNALS—See SIGNALS.

MARINE SUPPLIES.
**Ferdinand, L. W., & Co., Boston, Mass.**

MASTS, STEEL.
Welin Marine Equipment Co., Long Island City, N. Y.

MECHANICAL DRAFT.
American Blower Co., Detroit, Mich.
**Sturtevant Co., B. F., Hyde Park, Mass.**

MEGAPHONES—See CHANDLERY STORES.

METAL WORKING TOOLS—See TOOLS, MACHINE.

METALLIC PACKING—Also see PACKING.
Katzenstein, L., & Co., New York.
Power Specialty Co., New York.
Rooksby, E. J., & Co., Philadelphia, Pa.
**United States Metallic Packing Co., Philadelphia, Pa.**

METRES, ELECTRIC.
General Electric Co., Schenectady, N. Y.
**Weston Electrical Instrument Co., Waverly Park, Newark, N. J.**

MILLING MACHINES.
Niles-Bement-Pond Co., New York.

MINERAL WOOL—See NON-CONDUCTING COVERING.

MONEL METAL.
Biddle Hardware Co., Philadelphia, Pa.

MONITOR NOZZLES—See HOSE NOZZLES.

MOORING ENGINES.
American Engineering Co., Philadelphia, Pa.
Hyde Windlass Co., Bath, Maine.

MOTOR BOATS—See LAUNCHES AND YACHTS.

MOTOR BOAT SUPPLIES.
Ferdinand, L. W., & Co., Boston, Mass.

MOTORS, ELECTRIC.
General Electric Co., Schenectady, N. Y.

MOTORS, GASOLINE—See GASOLINE ENGINES.

MULTIPLE DRILLS.
Niles-Bement-Pond Co., New York.

MULTI-SPEED MOTORS.
Stow Mfg. Co., Binghamton, N. Y.

NAVAL ARCHITECTS—See PROFESSIONAL CARDS.

NEEDLE VALVES—See VALVES.

NIPPLES.
National Tube Co., Pittsburg, Pa.

NON-CONDUCTING COVERING.
Johns-Manville, H. W., Co., New York.

NOZZLES—See HOSE NOZZLES.

NUTS—See BOLTS AND NUTS.

OAKUM.
Baltimore Oakum Co., Baltimore, Md.
Davey, W. O., & Sons, Jersey City, N. J.
Welin Marine Equipment Co., Long Island City, N. Y.

OIL—See LUBRICANTS.

OIL BURNERS, FUEL—See FUEL OIL BURNERS.

OIL CUPS—See LUBRICATORS.

OIL FUEL APPARATUS.
Schutte & Körting Co., Philadelphia, Pa.

OIL ENGINES—See ENGINES, OIL.

OIL GAUGES.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
Powell Co., The, Wm., Cincinnati, Ohio.
Star Brass Mfg. Co., Boston, Mass.

OIL POLISH—See METAL POLISH.

OIL PUMPS.
Lunkenheimer Co., Cincinnati, Ohio.
Star Brass Mfg. Co., Boston, Mass.

OILING SYSTEMS—Also see LUBRICATORS.
Albany Lubricating Co., New York.
Cook's Sons, Adam, New York.
Lunkenheimer Co., Cincinnati, Ohio.
Powell Co., Wm., Cincinnati, Ohio.
Schutte & Körting Co., Philadelphia, Pa.

PACKING—Also see METALLIC PACKING.
Johns-Manville, H. W., Co., New York.
New York Belting & Packing Co., Ltd., New York.
Peerless Rubber Mfg. Co., New York.
Power Specialty Co., New York.
Rooksby, E. J., & Co., Philadelphia, Pa.

PACKING, ASBESTOS.
Johns-Manville, H. W., Co., New York.

PAINT—Also see GRAPHITE; also MARINE PAINT.
Dixon, Jos., Crucible Co., Jersey City, N. J.
Toch Bros. New York.

PATENT ATTORNEYS—See ATTORNEYS, PATENT.

PETROL ENGINES—See GASOLINE ENGINES.

PHOSPHOR BRONZE CASTINGS.
Griscom-Russell Co., New York.
Hyde Windlass Co., Bath, Maine.
Lunkenheimer Co., Cincinnati, Ohio.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.

PILING—STEEL.
Lackawanna Steel Co., Buffalo, N. Y.

PIPE COVERING—See NON-CONDUCTING COVERING.

PIPE CUTTING AND THREADING MACHINES.
Niles-Bement-Pond Co., New York.

PIPE FLANGES—See FLANGES.

PIPE UNIONS.
Dart, E. M., Mfg. Co., Providence, R. I.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
National Tube Co., Pittsburg, Pa.
Powell Co., The, Wm., Cincinnati, Ohio.

PIPE WRENCHES.
McNab & Harlin Mfg. Co., New York.
Williams & Co., J. H., Brooklyn, N. Y.

PLANERS, STANDARD METAL WORKING AND ROTARY.
Niles-Bement-Pond Co., New York.

PLANERS, SHIP PLATE.
Niles-Bement-Pond Co., New York.

PLANIMETERS.
American Steam Gauge and Valve Mfg. Co., Boston, Mass.
Star Brass Mfg. Co., Boston, Mass.

PLATE-BENDING ROLLS.
Niles-Bement-Pond Co., New York.

PLUMBAGO—Also see GRAPHITE.
Dixon, Jos., Crucible Co., Jersey City, N. J.

PLUMBING—Also see CHANDLERY STORES.
Davidson, M. T., Co., New York.
Sands, Alfred B., & Son Co., New York.

PNEUMATIC SEPARATORS.
Griscom-Russell Co., New York.
Sturtevant Co., B. F., Hyde Park, Mass.

PNEUMATIC TOOLS—Also see AIR COMPRESSORS.
Independent Pneumatic Tool Co., Chicago and New York.

POPPET VALVES—See VALVES.

PORTABLE CYLINDER BORING BARS—See CYLINDER BORING BARS.

PORTABLE DRILLS.
General Electric Co., Schenectady, N. Y.
Stow Mfg. Co., Binghamton, N. Y.

POWER PUNCHES AND SHEARS—See TOOLS, MACHINE.

PRESSURE REGULATORS.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Ashton Valve Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
Lytton Mfg. Corp., Franklin, Va.
McNab & Harlin Mfg. Co., New York.
Powell Co., Wm., Cincinnati, Ohio.
Star Brass Mfg. Co., Boston, Mass.
Watertown Specialty Co., Watertown, N. Y.

PRODUCERS—See MARINE GAS PRODUCERS.

PROFESSIONAL CARDS.
Cox & Stevens, New York.
Decker, Delbert H., Washington, D. C.
Donnelly, W. T., New York.
Whitaker, Morris M., Nyack-on-Hudson, N. Y.

PROJECTORS—See SEARCHLIGHTS.

PROPELLER WHEELS.
Donnelly, W. T., New York.
Hyde Windlass Co., Bath, Me.
Roelker, H. B., New York.
Sheriffs Mfg. Co., Milwaukee, Wis.
Trout, H. G., Co., Buffalo, N. Y.

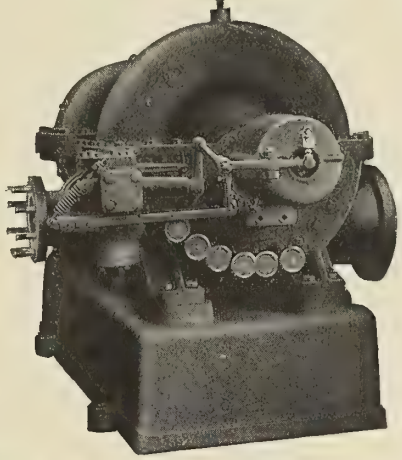
PROPELLING ENGINES—See ENGINES, PROPELLING.

PUMPS.
Alberger Pump and Condenser Co., New York.
Blake & Knowles Steam Pump Works, New York.
Davidson, M. T., Co., New York.
De Laval Steam Turbine Co., Trenton, N. J.
Griscom-Russell Co., New York.
Hyde Windlass Co., Bath, Maine.
Kingsford Foundry & Machine Works, Oswego, N. Y.
Sands, A. B., & Son Co., New York.
Terry Steam Turbine Co., Hartford, Conn.
Wheeler Condenser and Engineering Co., Carteret, N. J.


# DE LAVAL

## CLASS "C" TURBINES

### Are Safe



THE shaft is exceptionally large and each row of buckets is mounted on a separate wheel, rather than upon the broad rim of one wheel. There are two governors, one a speed governor and the second an independent emergency governor which trips a safety shut-off valve. In any case, damage to wheel case or surroundings is absolutely prevented by the heavy steel retaining ring. A safety relief valve is attached to the casing cover. Made in all sizes suitable for the driving of power plant auxiliaries.

Send for Special Booklet G 46

**DE LAVAL**
Steam Turbine Company No. 76-B
*Trenton* *New Jersey*

**PROFESSIONAL CARDS**

COX & STEVENS
Consulting Engineers, Naval Architects, Marine Engineers
VESSELS SURVEYED MARINE INSURANCE
AGENTS FOR SALE AND CHARTER VESSELS OF ALL CLASSES
15 WILLIAM STREET Telephone 1375 Broad NEW YORK

WILLIAM T. DONNELLY
Consulting Engineer and Naval Architect
17 BATTERY PLACE, NEW YORK
DESIGNER OF FLOATING DRY DOCKS STEEL AND WOOD
PLANS ON HAND FOR DOCKS FROM 1,000 TO 10,000 TONS
Write for information on Mechanical Lift Dock for Small Vessels

MORRIS M. WHITAKER
Naval Architect
NYACK-ON-HUDSON, N. Y.
SPECIALIST IN THE DESIGN OF VESSELS PROPELLED BY INTERNAL COMBUSTION MOTORS

**Wheeler Condenser & Engineering Co.**
Surface Condensers, Feed Water Heaters, Centrifugal Pumps
Rotative Dry Vacuum Pumps, "EDWARDS" Air Pumps
Supplies and Repairs for Marine Machinery at Short Notice
Ask for Literature **Carteret, N. J.**

We would esteem it a privilege to answer any question that may arise in regard to

JEFFERY'S MARINE GLUE

L. W. FERDINAND & CO., 201 South St., Boston, Mass., U. S. A.

Simplex means quality, the quality that has stood the test, the "customers test," the test that means hard work well done.

SIMPLEX ELECTRIC HEATING CO.
CAMBRIDGE, MASS.
MONADNOCK BLOCK CHICAGO

ONE
Hayward
Hand Grenade
Thrown On a Fire
Promptly is Enough

The cheapest, simplest and handiest form of fire extinguisher on the market for steam and sailing craft.

GOOD UNTIL USED. NOT AFFECTED BY CLIMATIC OR TEMPERATURE CHANGES

Used by U. S. Navy and leading Steamship lines.

*Send For Booklet*

S. F. HAYWARD & CO., 39 PARK PLACE NEW YORK

We use HEMP ROPE exclusively
in the manufacture of our

OAKUM

It spins a thread of greater length.
It drives better.
It is more economical.
It lasts longer than other Oakum on the market.

*You can demonstrate these facts by a trial.*

WRITE FOR PRICES

W. O. Davey & Sons

170 Laidlaw Ave. Jersey City, N. J.

PUMPS, DREDGING.
Terry Steam Turbine Co., Hartford, Conn.

PUMPS, MARINE GLUE.
Ferdinand, L. W., & Co., Boston, Mass.

PUNCHING MACHINES AND SHEARING MACHINES, HYDRAULIC POWER AND HAND.
Niles-Bement-Pond Co., New York.

PYROMETERS.
H. & M. Division of the Taylor Instrument Cos., Rochester, N. Y.

QUADRANT DAVITS—See DAVITS.

RAFTS—See LIFE BOATS AND RAFTS.

RAILWAY DRY DOCKS.
Crandall Engineering Co., East Boston, Mass.

RANGE FINDERS.
Nicholson Ship Log Co., Cleveland, Ohio.
Schuette Recording Compass Co., Manitowoc, Wis.

RANGES.
Sands, A. B., & Son Co., New York.

RASPS.
Nicholson File Co., Providence, R. I.

REAMERS.
Morse Twist Drill & Machine Co., New Bedford, Mass.

REAMERS—PNEUMATIC.
Independent Pneumatic Tool Co., Chicago and New York.

RECORDING COMPASSES.
Nicholson Ship Log Co., Cleveland, Ohio.
Schuette Recording Compass Co., Manitowoc, Wis.

REDUCING VALVES—See VALVES.

REDUCING WHEEL.
American Steam Gauge and Valve Mfg. Co., Boston, Mass.

REFLEX WATER GAUGES.
Jerguson Gage & Valve Co., Boston, Mass.

REFRIGERATING ENGINEERS—See ENGINEERS, CONSULTING.

REFRIGERATING PLANTS.
Brunswick Refrigerating Co., New Brunswick, N. J.
Roelker, H. B., New York.

REGRINDING VALVES—See VALVES.

RELEASING GEAR.
Welin Marine Equipment Co., Long Island City, N. Y.

RELIEF VALVES—See VALVES.

REVOLUTION COUNTERS.
American Steam Gauge and Valve Mfg. Co., Boston, Mass.
Ashton Valve Co., Boston, Mass.

RHEOSTATS.
General Electric Co., Schenectady, N. Y.
Simplex Electric Heating Co., Cambridge, Mass.

RIGGING—See WIRE ROPE.

RIVER BOATS—Also see SHIPBUILDERS AND DRY DOCK COS.
Marine Iron Works, Chicago, Ill.
Merrill-Stevens Co., Jacksonville, Fla.
Ward, Chas., Engineering Works, Charleston, W. Va.

RIVETS.
Champion Rivet Co., Cleveland, Ohio.

RIVETING MACHINES, HYDRAULIC AND STEAM POWER.
Independent Pneumatic Tool Co., Chicago and New York.
Niles-Bement-Pond Co., New York.

RIVETERS, PNEUMATIC.
Independent Pneumatic Tool Co., Chicago and New York.

ROLLER BEARINGS—See THRUST BEARINGS.

ROLLS, BENDING AND STRAIGHTENING.
Niles-Bement-Pond Co., New York.

ROOFING PAINTS.
Ferdinand, L. W., & Co., Boston, Mass.

ROPE—Also see WIRE ROPE, TRANSMISSION ROPE, and MANILA AND SISAL ROPE.
Columbian Rope Co., Auburn and New York.
Durable Wire Rope Co., Boston, Mass.
Griscom-Russell Co., New York.
Phosphor-Bronze Smelting Co., Ltd., Philadelphia, Pa.
Plymouth Cordage Co., North Plymouth, Mass.

ROTARY BLOWERS—See BLOWERS.

ROWBOATS—See LAUNCHES AND YACHTS.

RUBBER BELTING.
Hayward, S. F., & Co., New York.

RUBBER GOODS—Also see Packing—Also see INTERLOCKING RUBBER TILING.
Griscom-Russell Co., New York.
Hayward, S. F., & Co., New York.
New York Belting & Packing Co., Ltd., New York.
Peerless Rubber Mfg. Co., New York.

RUBBER MATTING CEMENT.
Ferdinand, L. W., & Co., Boston, Mass.

RUBBER TILING—See INTERLOCKING RUBBER TILING.

RUBBER VALVES—See VALVES, RUBBER.

SAFETY VALVES—See VALVES.

SANITARY FITTINGS—See PLUMBING.

SANITARY PUMPS—See PLUMBING.

SEARCHLIGHTS.
Carlisle & Finch Co., Cincinnati, Ohio.
General Electric Co., Schenectady, N. Y.

SENTINEL VALVES—See VALVES.

SEPARATORS—PNEUMATIC—See PNEUMATIC SEPARATORS .

SHAFTING—HOLLOW, SEAMLESS STEEL.
National Tube Co., Pittsburg, Pa.

SHAFT STEEL—See STEEL SHAFTING.

SHALLOW-DRAFT RIVER BOATS—See RIVER BOATS. Also SHIPBUILDERS AND DRY DOCK COMPANIES.

SHEARING MACHINES, HYDRAULIC, STEAM POWER AND HAND.
Niles-Bement-Pond Co., New York.

SHEATHING METAL—See YELLOW METAL; also BRASS AND COPPER.

SHEETING, ASBESTOS.
Johns-Manville, H. W., Co., New York.

SHIPBUILDERS AND DRY DOCK COMPANIES—See also RIVER BOATS.
Bath Iron Works, Bath, Maine.
Fletcher, W. & A., Co., Hoboken, N. J.
Fore River Shipbuilding Co., Quincy, Mass.
Krajewski-Pesant Corporation, Havana, Cuba.
Marine Iron Works, Chicago, Ill.
Marvel, T. S., Shipbuilding Co., Newburg, N. Y.
Merrill-Stevens Co., Jacksonville, Fla.
Newport News Shipbuilding & Dry Dock Co., Newport News, Va.
Seattle Construction & Dry Dock Co., Seattle, Wash.
Tietjen & Lang Dry Dock Co., Hoboken, N. J.
Ward, Chas., Engineering Works, Charleston, W. Va.

SHIP CHANDLERS—See CHANDLERY STORES.

SHIP ELEVATORS—See MARINE ELEVATORS.

SHIP FITTINGS.
Ferdinand, L. W., & Co., Boston, Mass.
Griscom-Russell Co., New York.

SHIP GLUE—See MARINE GLUE.

SHIP LOGS AND SPEED INDICATORS.
Schuette Recording Compass Co., Manitowoc, Wis.

SHIP STORES—See CHANDLERY STORES.

SHIPYARDS—See SHIPBUILDERS.

SHOWER BATHS—See PLUMBING.

SLOTTING MACHINES.
Niles-Bement-Pond Co., New York.

SMOOTH-ON.
Smooth-On Mfg. Co., Jersey City, N. J.

SOOT BLOWERS.
Diamond Power Specialty Co., Detroit, Mich.

SPEED INDICATORS FOR SHIPS, YACHTS AND MOTOR BOATS.
Schuette Recording Compass Co., Manitowoc, Wis.

SPRINGS, VANADIUM.
American Vanadium Co., Pittsburg, Pa.

STEAM ACETYLENE LIGHTING SYSTEMS.
Milburn, Alex. C., Co., Baltimore, Md.

STEAM ENGINE INDICATORS—See INDICATORS.

STEAM ENGINES—See ENGINES.

STEAM GAUGES.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Ashton Valve Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
Lytton Mfg. Corp., Franklin, Va.
McNab & Harlin Mfg. Co., New York.
Powell Co., Wm., Cincinnati, Ohio.
Star Brass Mfg. Co., Boston, Mass.

STEAM HAMMERS.
Niles-Bement-Pond Co., New York.

STEAM AND HOT-BLAST APPARATUS.
American Blower Co., Detroit, Mich.
Sturtevant Co., B. F., Hyde Park, Mass.

STEAM PUMPS—See PUMPS.

STEAM SEPARATORS.
Griscom-Russell Co., New York.

STEAM SPECIALTIES.
Alberger Pump and Condenser Co., New York.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Ashton Valve Co., Boston, Mass.
Diamond Power Specialty Co., Detroit, Mich.
Griscom-Russell Co., New York.


**Albany Grease**

**All Lubricant—No Waste**

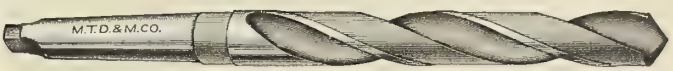
Is a great friction reducer, as has been shown in both impartial tests and actual service. It is made of pure, natural materials. **TRY ALBANY GREASE AT OUR EXPENSE.** A liberal sample, an Albany Grease Cup and our new book, "Death to Friction," will be sent free of charge to **MAKE GOOD** our claims, on receipt of your name and address.

At your dealer—if not, order direct

**Albany Lubricating Company**

708-710 Washington St., New York

**"Morse"**




**Twist Drills and Tools**

Marine Engines require high class tools in their construction. "Morse" Tools are in every way adequate.

**Morse Twist Drill and Machine Co.**

NEW BEDFORD, MASS.

**IF you have a boat, or are about to build one, to be used for freight, passenger, fishing, or any other commercial purpose, requiring from 20 to 500 horsepower, there is no possible *economic* reason to justify your using any power but *PRODUCER GAS.***

**Our Marine Producer Gas Power Plants operate at a cost which is by actual comparative tests 85% cheaper than gasolene, 65% cheaper than steam. Daily operation on scores of boats has proved this; your boat will prove no exception.**

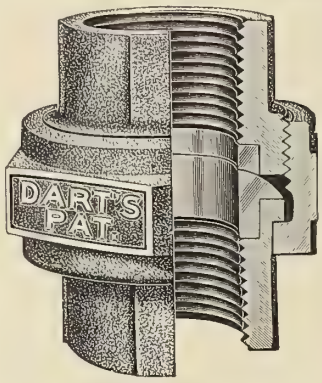
**Then again, gas power is notably safe, reducing insurance to a minimum. Our plants need attention but a few minutes every two hours. Their weight is half that of a steam plant, and they require but half the space.**

**Could you ask more?**

Address:

**MARINE PRODUCER GAS POWER COMPANY**
**2 Rector Street, New York City**

**Branches: Allen W. Fulton & Co., 514 East Pratt St., Baltimore, Md.**
**The H. E. Ploof Machinery Co., 20 No. Ocean St., Jacksonville, Fla.**




The Bronze Spherical Seats in combination with Malleable Pipe Ends give the

**DART**
**PATENT UNION**

a distinctive feature which has been unequalled. It is the acknowledged leader.

**E. M. DART MFG. CO.**
**Providence, R. I.**

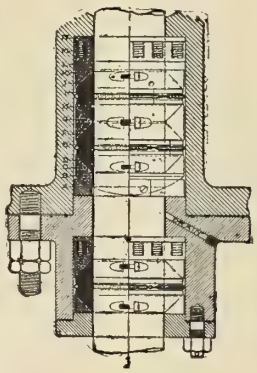
FAIRBANKS CO. & BRANCHES, Distributors

Canadian Factory
DART UNION CO., Ltd.
Toronto

KATZENSTEIN'S
**Metallic Packings**

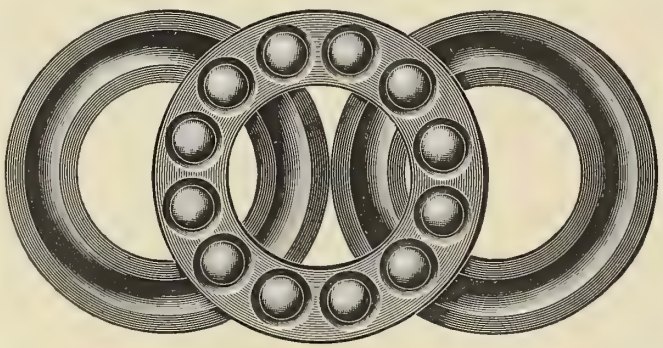
Of different designs for stuffing boxes of engines, pumps, etc

Flexible Tubular Metallic Packing for Slip Joints on Steam Pipes . . . . .



**L. KATZENSTEIN & CO.**
General Machinists' and Engineers' Supplies . . .
**358 West St., New York, U. S. A.**

**THE ONLY**
**Propeller Thrust**
**FOR HIGH SPEED**



**Bantam Anti-Friction Co.**
**BANTAM, CONN., U. S. A.**

**WE MAKE THE BEST**


Jerguson Gage & Valve Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
Lytton Mfg. Corp., Franklin, Va.
McNab & Harlin Mfg. Co., New York.
National Tube Co., Pittsburg, Pa.
Powell, Wm., Co., New York.
Power Specialty Co., New York.
Schutte & Körting Co., Philadelphia, Pa.
Star Brass Mfg. Co., Boston, Mass.
Tillotson Humidifier Co., Providence, R. I.
Watertown Specialty Co., Watertown, N. Y.

STEAM SUPERHEATERS.
Babcock & Wilcox Co., New York.
Power Specialty Co., New York.

STEAM TRAPS.
American Blower Co., Detroit, Mich.
Griscom-Russell Co., New York.
Lytton Mfg. Corp., Franklin, Va.
National Tube Co., Pittsburg, Pa.
Schutte & Körting Co., Philadelphia, Pa.
Sturtevant Co., B. F., Hyde Park, Mass.
Tillotson Humidifier Co., Providence, R. I.

STEAM TURBINES.
Alberger Pump and Condenser Co., New York.
Bath Iron Works, Bath, Maine.
Bryant-Bery Steam Turbine Co., Detroit, Mich.
De Laval Steam Turbine Co., Trenton, N. J.
Fletcher, W. & A., Co., Hoboken, N. J.
Fore River Shipbuilding Co., Quincy, Mass.
General Electric Co., Schenectady, N. Y.
Kerr Turbine Co., Wellsville, N. Y.
Parsons Marine Steam Turbine Co., New York.
Terry Steam Turbine Co., Hartford, Conn.

STEAM TURBINE DYNAMOS.
De Laval Steam Turbine Co., Trenton, N. J.
General Electric Co., Schenectady, N. Y.

STEAMERS, LIGHT-DRAFT, RIVER—See RIVER BOATS.

STEEL BALLS.
Bantam Anti-Friction Co., Bantam, Conn.

STEEL SHEET PILING.
Lackawanna Steel Co., Buffalo, N. Y.

STEEL VALVES—See FORGED STEEL VALVES.

STEEL, VANADIUM.
American Vanadium Co., Pittsburg, Pa.

STEERING GEARS.
American Engineering Co., Philadelphia, Pa.
Hyde Windlass Co., Bath, Maine.

STEERING ENGINES.
American Engineering Co., Philadelphia, Pa.
Hyde Windlass Co., Bath, Maine.
Lidgerwood Mfg. Co., New York.
Sheriffs Mfg. Co., Milwaukee, Wis.

STEERING WHEELS.
American Engineering Co., Philadelphia, Pa.
Hyde Windlass Co., Bath, Maine.

STOP COCKS—See VALVES.

STOVES—See RANGES.

STRAIGHTENING ROLLS—See ROLLS.

SUB-MARINE PAINT.
Toch Bros. New York.

SUPERHEATERS—See STEAM SUPERHEATERS.

SUPERHEATER TUBES.
National Tube Co., Pittsburg, Pa.

SURFACE CONDENSERS—See CONDENSERS.

SWITCHBOARDS—See ELECTRICAL INSTRUMENTS.

TACKLE BLOCKS—See BLOCKS.

TANKS—COPPER, GALVANIZED IRON.
Griscom-Russell Co., New York.
Sands, A. B., & Son Co., New York.

TARPAULINS.
Wilford Cloth Co., New York.

TEAK—See LUMBER.

THERMOMETERS—FOR EVERY PURPOSE.
H. & M. Division of the Taylor Instrument Cos., Rochester, N. Y.

THREADING AND CUTTING MACHINES—See PIPE CUTTING AND THREADING MACHINES.

THROTTLE VALVES—See VALVES.

THRUST BEARINGS.
Bantam Anti-Friction Co., Bantam, Conn.

TILING—See INTERLOCKING RUBBER TILING.

TOILET ACCESSORIES.
Sands, A. B., & Son Co., New York.

TOOLS, MACHINE.
Niles-Bement-Pond Co., New York.
Stow Mfg. Co., Binghamton, N. Y.

TOOLS, MACHINISTS' AND CARPENTERS—See BENCH TOOLS.

TOWING HOOKS AND CHOCKS.
American Engineering Co., Philadelphia, Pa.

TOWING MACHINES.
American Engineering Co., Philadelphia, Pa.

TRANSMISSION ROPE—See ROPE.

TRAPS—See STEAM TRAPS.

TUBES—See BOILER TUBES; also BRASS AND COPPER.

TUBE CLEANERS—See BOILER-FLUE CLEANERS.

TUBE CUTTERS—See BOILER TUBE CUTTERS.

TUGS—See SHIPBUILDERS.

TURBINES—See STEAM TURBINES.

TURNING ENGINES.
American Engineering Co., Philadelphia, Pa.

TURRET LATHES—See LATHES, TURRET.

TWINE—See ROPE—Also CORDAGE.
Columbian Rope Co., Auburn, N. Y.
Plymouth Cordage Co., North Plymouth, Mass.

TWIST DRILLS.
Morse Twist Drill & Machine Co., New Bedford, Mass.

UNIONS—See PIPE UNIONS.

VACUUM GAUGES—See STEAM GAUGES.

VACUUM TRAPS.
Griscom-Russell Co., New York.
Lytton Mfg. Corp., Franklin, Va.

VALVES—Also see RUBBER VALVES AND WATER VALVES.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Ashton Valve Co., Boston, Mass.
Griscom-Russell Co., New York.
Jerguson Gage & Valve Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
Lytton Mfg. Corp., Franklin, Va.
McNab & Harlin Mfg. Co., New York.
National Tube Co., Pittsburg, Pa.
Powell, Wm., Co., Cincinnati, Ohio.
Power Specialty Co., New York.
Schutte & Körting Co., Philadelphia, Pa.
Star Brass Mfg. Co., Boston, Mass.

VALVES—BALANCED THROTTLE VALVES AND QUADRANT VALVES FOR SHIP ENGINES.
Schutte & Körting Co., Philadelphia, Pa.

VALVES, WATER.
Continental Iron Works, Brooklyn, N. Y.
Jerguson Gage & Valve Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.

VANADIUM.
American Vanadium Co., Pittsburg, Pa.

VANADIUM STEEL.
American Vanadium Co., Pittsburg, Pa.

VARNISH—See PAINT.

VENTILATING FANS—See BLOWERS.

VENTILATORS.
Sands, A. B., & Son Co., New York.

VERTICAL PUMPS—See PUMPS.

VOLTMETERS—See ELECTRICAL INSTRUMENTS.

WATER CLOSETS—PUMP WATER CLOSETS—See PLUMBING.

WATER COLUMNS.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Jerguson Gage & Valve Co., Boston, Mass.
McNab & Harlin Mfg. Co., New York.
Lunkenheimer Co., Cincinnati, Ohio.
National Tube Co., Pittsburg, Pa.
Star Brass Mfg. Co., Boston, Mass.
Watertown Specialty Co., Watertown, N. Y.

WATER GAUGES AND ALARMS.
Jerguson Gage & Valve Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
National Tube Co., Pittsburg, Pa.
Watertown Specialty Co., Watertown, N. Y.

WATERPROOF CANVAS—See CANVAS, WATERPROOF.

WATERPROOF LIQUID CEMENT.
Ferdinand, L. W., & Co., Boston, Mass.

WATERPROOF LIQUID GLUE.
Ferdinand, L. W., & Co., Boston, Mass.

WATERPROOF PAINT.
Dixon, Joseph, Crucible Co., Jersey City, N. J.
Ferdinand, L. W., & Co., Boston, Mass.

WATERTUBE BOILERS—See BOILERS.

WATER VALVES—See VALVES, WATER.

WHARF DROPS.
American Engineering Co., Philadelphia, Pa.

WHISTLES.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Ashton Valve Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
Powell Co., The Wm., Cincinnati, Ohio.
Star Brass Mfg. Co., Boston, Mass.

WHITE METAL
Griscom-Russell Co., New York.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.

WINDLASSES.
American Engineering Co., Philadelphia, Pa.
Hyde Windlass Co., Bath, Me.
Lidgerwood Mfg. Co., New York.

WINCHES—See WINDLASSES.

WIRE ROPE
American Engineering Co., Philadelphia, Pa.
Durable Wire Rope Co., Boston, Mass.
Phosphor-Bronze Smelting Co., Ltd., Philadelphia, Pa.

WIRE VANADIUM.
American Vanadium Co., Pittsburg, Pa.

WOOD SAWS—PNEUMATIC.
Independent Pneumatic Tool Co., Chicago and New York.

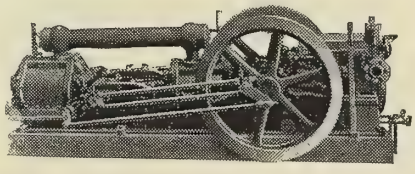
WRENCHES—Also see PIPE WRENCHES.
McNab & Harlin Mfg. Co., New York.
Williams & Co., J. H., Brooklyn, N. Y.

YACHT GLUE—See MARINE GLUE.

YACHTS—See LAUNCHES AND YACHTS; also SHIPBUILDERS.

ELEPHANT BRAND
DELTA
REG. U.S. PAT. OFF.
THE PHOSPHOR BRONZE SMELTING CO.
2200 WASHINGTON AVENUE, PHILADELPHIA, PA.
ELEPHANT BRAND "Phosphor-Bronze"
INGOTS, CASTINGS, WIRE, SHEETS, RODS, Etc.
—DELTA METAL—
IN BARS FOR FORGING AND FINISHED RODS
ORIGINAL AND SOLE MAKERS IN THE U. S.

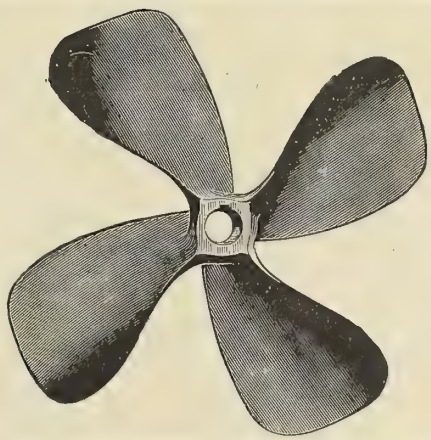
The Invincible Nozzle
Fire Department Supplies
ANDREW J. MORSE & SON
INCORPORATED
221 HIGH ST., BOSTON, MASS.
DIVING APPARATUS


AIR AND GAS COMPRESSORS
THE NORWALK IRON WORKS
SOUTH NORWALK, CONN.

UNITED STATES METALLIC PACKINGS
For Piston Rods and Valve Stems of Main and Auxiliary Engines
THE UNITED STATES METALLIC PACKING COMPANY
PHILADELPHIA AND CHICAGO

T. S. MARVEL SHIPBUILDING CO.
SHIP and ENGINE BUILDERS
NEWBURG, N. Y.

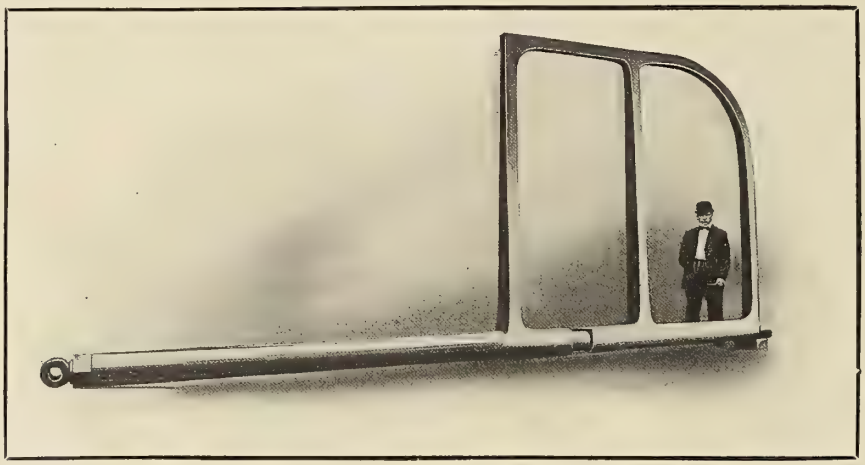
OAKUM
BALTIMORE OAKUM CO.
BALTIMORE, MD.
Manufacturers of Hygrade
MARINE AND PLUMBERS' OAKUM
For sale everywhere by all dealers. Established 1872


Wheel Problems require special attention.
Write to us.
H. G. Trout Co.
BUFFALO, N. Y.
Propeller Wheels and Engines

# SIZER FORGE COMPANY

## HOME OFFICE AND WORKS---BUFFALO, N. Y.

DREDGE



MARINE

ENGINE

MISCELL

# FORGINGS

## ANY WEIGHT---ANY FINISH---ANY MATERIAL


## INDEX TO ADVERTISERS


| | PAGES |
|---|---|
| ALBANY LUBRICATING CO., New York | 53 |
| ALBERGER PUMP AND CONDENSER CO., New York | 21 |
| ALMY WATER TUBE BOILER CO., Providence, R. I. | 22 |
| AMERICAN BLOWER CO., Detroit, Mich. | 44 |
| AMERICAN BUREAU OF SHIPPING, New York | 38 |
| AMERICAN ENGINEERING CO., Philadelphia, Pa. | 45 |
| AMERICAN STEAM GAUGE & VALVE MFG. CO., Boston, Mass., | Outside Back Cover |
| AMERICAN VANADIUM CO., Pittsburgh, Pa. | 7 |
| ASHTON VALVE CO., Boston, Mass. | Inside Front Cover |
| ASHWELL & NESBIT, London, England | 31 |
| ASPINALL'S PATENT GOVERNOR CO., Liverpool, England | 32 |
| ATKINSON-FRIZELLE CO., Hoboken, N. J. | 37 |
| AULD COMPANY, Philadelphia, Pa. | 20 |
| BABCOCK & WILCOX CO., New York | 24 |
| BALDT ANCHOR CO., Chester, Pa. | 57 |
| BALTIMORE OAKUM CO., Baltimore, Md. | 55 |
| BANTAM ANTI-FRICTION CO., Bantam, Conn. | 54 |
| BATH IRON WORKS, Bath, Maine | 34 |
| BIDDLE HARDWARE CO., Philadelphia, Pa. | 41 |
| BLAKE & KNOWLES STEAM PUMP WORKS, New York | 26 |
| BOURSE, THE, Philadelphia, Pa. | 36 |
| BRIDGEPORT MOTOR CO., Bridgeport, Conn. | 35 |
| BRITISH MANNESMAN TUBE CO., LTD., London, England | 30 |
| BROWN, ARTHUR R., London, England | 33 |
| BRUNSWICK REFRIGERATING CO., New Brunswick, N. J. | 46 |
| BRYANT-BERY STEAM TURBINE CO., Detroit, Mich. | 42 |
| BUTTERFIELD, W. P., LTD., Shipley, England | — |
| CALLENDER & CO., G. M., LTD., London, England | 33 |
| CARELS FRÈRES, Ghent, Belgium; and New York | 39 |
| CARLISLE & FINCH CO., Cincinnati, Ohio | 17 |
| CEDERVALL & SONER, F. R., Gothenburg, Sweden | 28 |
| CHAMPION RIVET CO., Cleveland, Ohio | 17 |
| COLUMBIAN ROPE CO., Auburn and New York | Below Table of Contents, in Front of Magazine |
| CONTINENTAL IRON WORKS, Brooklyn, N. Y. | 20 |
| COOK'S SONS, ADAM, New York | 53 |
| CO-OPERATIVE PUBLISHING CO., Baltimore, Md. | 17 |
| COX & STEVENS, New York | 51 |
| CRANDALL ENGINEERING CO., East Boston, Mass. | 37 |
| DART MFG. CO., E. M., Providence, R. I. | 54 |
| DAVEY, W. O., & SONS, Jersey City, N. J. | 52 |
| DAVIDSON, M. T., CO., New York | 49 |
| DECKER, DELBERT H., Washington, D. C. | 57 |
| DE LAVAL STEAM TURBINE CO., Trenton, N. J. | 51 |
| DEXINE PATENT PACKING & RUBBER CO., LTD., Stratford, London, England | 31 |
| DIAMOND POWER SPECIALTY CO., Detroit, Mich. | 57 |
| DIXON CRUCIBLE CO., JOS., Jersey City, N. J. | 9 |
| DONNELLY, W. T., New York | 35 and 51 |
| DURABLE WIRE ROPE CO., Boston, Mass. | 38 |
| ERIE FORGE CO., Erie, Pa. | 48 |
| EUREKA FIRE HOSE MFG. CO., New York | 45 |
| FERDINAND & CO., L. W., Boston, Mass. | 52 |
| FLETCHER CO., W. & A., Hoboken, N. J. | 34 |
| FORE RIVER SHIPBUILDING CO., Quincy, Mass. | 34 |
| FUMIGATING AND FIRE EXTINGUISHING CO. OF AMERICA New York | 36 |

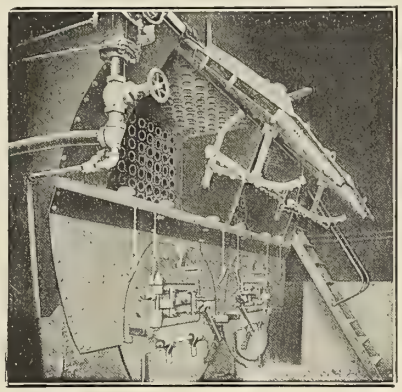
| | PAGES |
|---|---|
| GENERAL ELECTRIC CO., Schenectady, N. Y. | Page facing leading article in front |
| GREENWOOD & BATLEY, LTD., Leeds, England | 30 |
| GRISCOM-RUSSELL CO., New York | 22 |
| H. & M. DIVISION OF TAYLOR INSTRUMENT COMPANIES, Rochester, N. Y. | 49 |
| HAYWARD & CO., S. F., New York | 52 |
| HEATH & CO., LTD., London, England | 31 |
| HUTCHINSON, RIVINUS & CO., Philadelphia & New York | 17 |
| HYDE WINDLASS CO., Bath, Me | Inside Front Cover |
| INDEPENDENT PNEUMATIC TOOL CO., Chicago and New York | 45 |
| ISHERWOOD, J. W., London, England | 27 |
| JERGUSON GAGE & VALVE CO., Boston, Mass | 26 |
| JOHNS-MANVILLE CO., H. W., New York | 16 |
| KATZENSTEIN & CO., L., New York | 54 |
| KERR TURBINE CO., Wellsville, N. Y. | 46 |
| KIND, ING. P., & CO., Turin, Italy | 30 |
| KINGSFORD FOUNDRY & MACHINE WORKS, Oswego, N. Y. | 24 |
| KRAJEWSKI-PESANT CORPORATION, Havana, Cuba | 32 |
| LACKAWANNA STEEL CO., Buffalo, N. Y. | 40 |
| LIDGERWOOD MFG. CO., New York | Outside Front Cover and 39 |
| LUNKENHEIMER CO., THE, Cincinnati, Ohio | Inside Front Cover |
| LYTTON MFG. CORP., Franklin, Va | 26 |
| McNAB & HARLIN MFG. CO., New York | 23 |
| MARINE IRON WORKS, Chicago, Ill | 44 |
| MARINE PRODUCER GAS POWER CO., New York | 53 |
| MARVEL, T. S., SHIPBUILDING CO., New burgh, N. Y. | 55 |
| MERRILL-STEVENS CO., Jacksonville, Fla | 34 |
| MIETZ, A., New York | 36 |
| MILBURN, ALEX. C. CO., Baltimore, Md | 42 |
| MORSE, ANDREW J., & SON, INC., Boston, Mass | 55 |
| MORSE TWIST DRILL & MACHINE CO., New Bedford, Mass | 53 |
| MOSHER WATER TUBE BOILER CO., New York | 24 |
| NATIONAL TUBE CO., Pittsburgh, Pa | 28 |
| NEWPORT NEWS SHIPBUILDING & DRY DOCK CO., Newport News, Va | 34 |
| NEW YORK BELTING & PACKING CO., New York | 11 |
| NICHOLSON FILE CO., Providence, R. I | 48 |
| NILES-BEMENT-POND CO., New York | 32 |
| NORWALK IRON WORKS, South Norwalk, Conn | 55 |
| OTIS ELEVATOR CO., New York | Inside Back Cover |
| PARSONS MARINE STEAM TURBINE CO., New York | 26 |
| PEERLESS RUBBER MFG. CO., New York | 18 |
| PERKIN & CO., LTD., Leeds, England | — |



## "Diamond" Soot Blowers

are saving the coal-cost on the very foremost ships of every class.

The largest bulk freighter in the world —the *Col. James M. Schoonmaker*—has a "Diamond" on every boiler. The largest passenger boat on the Great Lakes—now building—will have 24 of them.



—showing how simple is the working of this new Diamond Soot Blower; it cleans both uptake and fire tubes at one operation and is entirely removed by opening the smokebox door.

***—for your marine boilers***

you should specify this new front-end design Diamond Soot Blower. *It will save coal-cost for you.*

By mechanically keeping soot off the heating surfaces, it will save *boiler-cost* too.

Write for your copy of "Bulletin 1"—giving full information—*today.*

**DIAMOND POWER SPECIALTY COMPANY**

*Soot Blowers for all Standard Boilers*

**58 First St., DETROIT, Mich., U. S. A.** 134

# PATENT

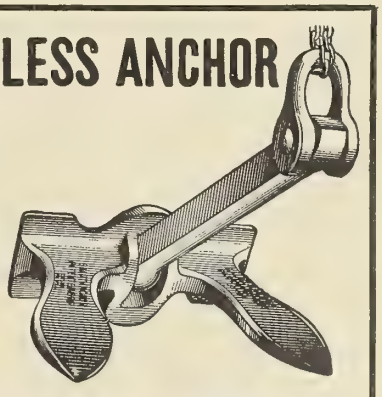
***That Invention***

For information how to do it inquire of Delbert H. Decker, 900 F St., Washington, D. C. 24 years' experience in Patent and Trade Maker Matters.

# BALDT STOCKLESS ANCHOR

**Made of the finest quality of open hearth steel, better than forgings.**

**Used extensively by the United States Navy on their battleships and cruisers.**



***Send for Catalogue***

**BALDT ANCHOR CO., CHESTER, PA.**

# Two Famous Lines

Plymouth Docking Line on S. S. Commonwealth

Among experienced travellers the Fall River Line holds a reputation, the keynote of which is *service.*

The use of

**PLYMOUTH ROPE**

**"The Rope You Can Trust"**

for docking lines contributes an important share to that result—to hundreds of similar reputations.

Service depends just as much on things which insure a safe arrival as upon those that make for a speedy, comfortable voyage.

Among the former, Plymouth Docking Lines have long occupied a place all their own. Their elasticity, strength and wearing qualities are famous. *Their* reputation is based on *service.*

PLYMOUTH CORDAGE COMPANY

NORTH PLYMOUTH, MASS.

THE MARK OF LEADERSHIP

*Distributing Agents in All Big Ports*



| | PAGES |
|---|---|
| PHOSPHOR BRONZE SMELTING CO., Philadelphia, Pa | 55 |
| PLYMOUTH CORDAGE CO., North Plymouth, Mass | 58 |
| POCAHONTAS FUEL CO., New York | 33 |
| POWELL, WILLIAM, CO., THE, Cincinnati, Ohio | 8 |
| POWER SPECIALTY CO., New York | 39 |
| ROBB ENGINEERING CO., LTD., South Framingham, Mass | 47 |
| ROELKER, H. B., New York | 38 |
| ROOKSBY, E. J., & CO., Philadelphia, Pa | 38 |
| ROSS SCHOFIELD CO., New York | 22 |
| SANDS & SON CO., A. B., New York | 47 |
| SCHUETTE RECORDING COMPASS CO., Manitowoc Wis | 47 |
| SCHUTTE & KORTING CO., Philadelphia, Pa | 20 |
| SEAMLESS STEEL BOAT CO., LTD., Wakefield, England | — |
| SEATTLE CONSTRUCTION & DRY DOCK CO., Seattle, Wash | 34 |
| SHELBY STEEL TUBE CO., Pittsburgh (See National Tube Co.) | — |
| SHERIFFS MFG. CO., Milwaukee, Wis | 22 |
| SIMPLEX ELECTRIC HEATING CO., Cambridgeport, Mass | 52 |
| SIROCCO ENGINEERING CO. (See American Blower Co.) | — |
| SISSON, W., & CO., LTD., Gloucester, England | — |
| SIZER FORGE CO., Buffalo, N. Y | 56 |
| SMITH'S DOCK CO., LTD., Middlesbrough, England | — |
| SMOOTH-ON MFG. CO., Jersey City, N. J | 28 |
| SMULDERS, F. A., Schiedam, Holland | 29 |
| SOTHERN, J. W., London, England | 32 |
| STANDARD CHAIN CO., Pittsburgh, Pa | Inside Front Cover |
| STANDARD MOTOR CONSTRUCTION CO., Jersey City, N. J | 35 |
| STAR BRASS MFG. CO., Boston, Mass | 23 |
| STARRETT CO., L. S., Athol, Mass | 8 |
| STOW MFG. CO., Binghamton, N. Y | 23 |
| STURTEVANT CO., B. F., Hyde Park, Mass | 21 |
| SULZER BROS., Winterthur, Switzerland | 9 |
| TAYLOR INSTRUMENT COMPANIES, Rochester, N. Y | 49 |
| TERRY STEAM TURBINE CO., Hartford, Conn | 10 |
| TIETJEN & LANG DRY DOCK CO., Hoboken, N. J | 34 |
| TILLOTSON HUMIDIFIER CO., Providence, R. I | 25 |
| TODD, T. S. & CO., New York | 9 |
| TOCH BROTHERS, New York | 19 |
| TROUT, H. G., CO., Buffalo, N. Y | 55 |
| UNITED STATES METALLIC PACKING CO., Philadelphia, Pa | 55 |
| VROOMAN, S. B. CO., LTD., Philadelphia, Pa | 45 |
| WALKER, W. G., & SONS, Edinburgh, Scotland | — |
| WARD, CHAS., ENGINEERING WORKS, Charleston, W. Va | 35 |
| WATERTOWN SPECIALTY CO., Watertown, N. Y | 16 |
| WELIN MARINE EQUIPMENT CO., Long Island City, N. Y. | 13 and 15 |
| WERF GUSTO, Schiedam, Holland | 29 |
| WESTON ELECTRICAL INSTRUMENT CO., Waverly Park, Newark, N. J | 43 |
| WHEELER CONDENSER & ENGINEERING CO., Carteret, N. J | 51 |
| WHITAKER, MORRIS M., Nyack-On-Hudson, N. Y | 51 |
| WILFORD CLOTH CO., New York | 9 |
| WILLIAMS & CO., J. H., Brooklyn, N. Y | 50 |
| WILSON, DAVID, PATENT NOISELESS WINCH CO., Liverpool, England | 29 |
| WILSON, R. & SONS, South Shields, England | — |
| WOLVERINE MOTOR WORKS, Bridgeport Conn | 36 |
| ZYNKARA CO., LTD., Newcastle-on-Tyne, England | — |

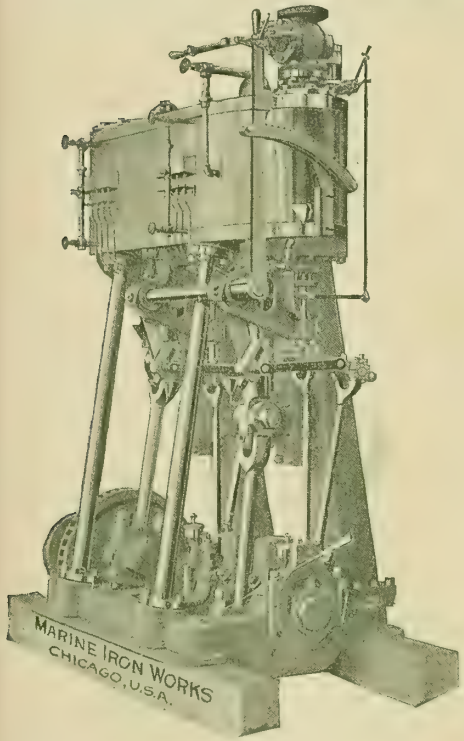
INDEXED.


# INTERNATIONAL MARINE ENGINEERING

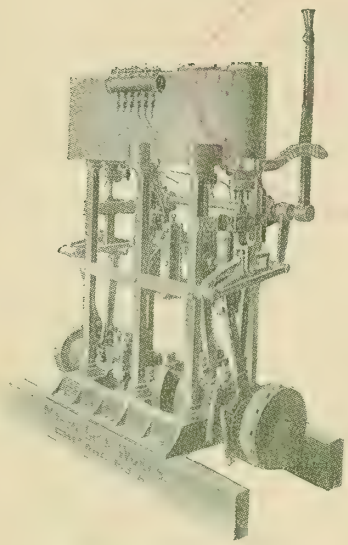
**NEW YORK, 17 Battery Place** **LONDON, 31 Christopher Street, E. C.**

SUBSCRIPTION PRICE: Domestic, $2.00; Foreign, $2.50.

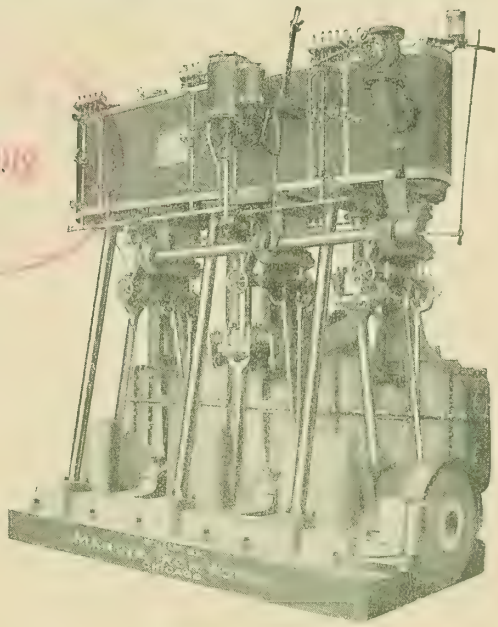





Heavy Service Fore and Aft Compound

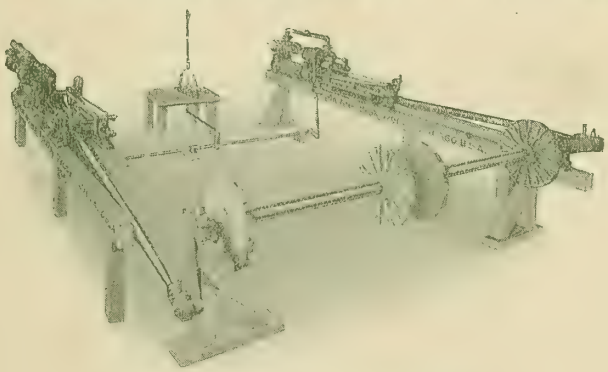


Open Column Frame
Fore and Aft Compound



Triple Expansion

# MARINE ENGINES



M. I. W. Centralized Valve Gear
Stern Paddle-Wheel Engines

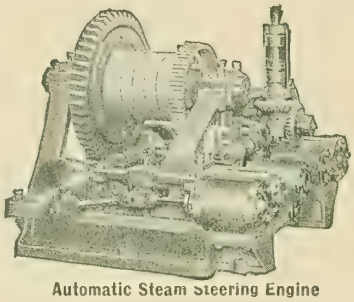
## MARINE IRON WORKS

CHICAGO, U. S. A.

Designers and Builders of Triple Expansion, Fore and Aft Compound, High Pressure and Stern Paddle-Wheel Machinery

Steel Framework and Complete Hulls for K.D. Shipment

# LIDGERWOOD



Automatic Steam Steering Engine

**STEAM STEERING ENGINES**

Approved Design
Best of Materials
Best Workmanship
Strong Reliable
Interchangeable Parts

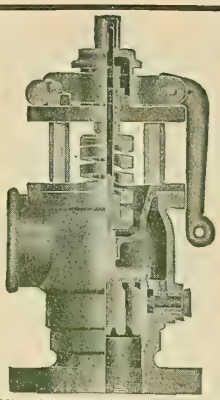
More than 34,000 Engines built and in use.

**Lidgerwood Mfg. Co., 96 Liberty St., New York**

# ASHTON

**POP SAFETY VALVES**

The **QUALITY STANDARD**



No. 17. Style for Superheated Steam

# ASHTON

**STEAM GAGES**

The **ACCURACY STANDARD**

**THE ASHTON VALVE CO.,** Boston, U. S. A.
NEW YORK — St. John's House, London, Eng. — CHICAGO

The Battleship "TEXAS," now under construction for the United States Navy, will be equipped with

**Steam Windlass, Steam Steering Engine and Screw Gear, Steam Coaling Winches, Electric Capstan, Electric Winch and Ash Hoist Engines**

MANUFACTURED BY

## HYDE WINDLASS COMPANY, Bath, Me.

This Company is also furnishing Windlasses, Steering Gears and other Auxiliaries for the Battleships "MORENO" and "RIVADAVIA," now under construction in this country for the Argentine Republic.

# You Can't Go Wrong

**When you specify**

## Lunkenheimer Oil and Grease Cups

**They are made of the highest grade of materials and are very strong, particularly in the shank, the part subjected to the greatest strain.**

**Jarring of the machinery to which they are attached will not shake them to pieces, nor will it affect the setting of the feed.**

**All cups are easily filled, and the sight-feeds on the oil cups are large, permitting the dropping oil to be seen from quite a distance, and do not easily become oil-splashed.**

**Lunkenheimer line of Oil and Grease Cups is a very large and complete one, and among them can readily be found a cup particularly adapted to suit any requirement.**

**"Most supply houses sell them—yours Can—if they Dont or Wont—tell Us"**

## The Lunkenheimer Company

**Largest Manufacturers of High-Grade Engineering Specialties in the World**

**General Offices and Works, Cincinnati, Ohio, U. S. A.**

| Chicago | New York | Boston | London, S. E. |
|---|---|---|---|
| 186 N. Dearborn St. | 64-68 Fulton St. | 138 High St. | 35 Great Dover St. |

# International Marine Engineering

JANUARY, 1912

## CONTENTS


| | | PAGE |
|---|---|---|
| LARGE RUSSIAN VESSELS PROPELLED BY DIESEL ENGINES. Illustrated | J. Rendell Wilson | 1 |
| NAVAL ARCHITECTS AND MARINE ENGINEERS' ANNUAL MEETING | | 5 |
| GAS ENGINES: THEIR DESIGN AND APPLICATION.—V | E. N. Percy | 8 |
| STEAM WHALING VESSELS. Illustrated | | 10 |
| PRODUCER GAS TOWBOAT. Illustrated | | 11 |
| NEW NAVAL VESSELS UNDER CONSTRUCTION FOR CUBA. Illustrated | | 12 |
| LIGHTERS AND LIGHTERAGE IN FREIGHT TRANSFERENCE. Illustrated | H. McL. Harding | 14 |
| THE BRITISH NATIONAL EXPERIMENTAL TANK | Professor H. A. Everett | 18 |
| STEAM TRAWLERS SURF AND SWELL. Illustrated | | 19 |
| SUPERDREADNOUGHTS FOR SOUTH AMERICAN REPUBLICS. Illustrated | | 20 |
| DEVELOPMENT OF THE MERCHANT MARINE SHIPBUILDING OF JAPAN | Dr. S. Terano and M. Yukawa | 24 |
| FIFTY YEARS' DEVELOPMENT IN MERCANTILE SHIP CONSTRUCTION | S. J. P. Thearle | 25 |
| THIRTY-FOOT FREIGHT LAUNCH. Illustrated | | 26 |
| REPAIR PLANT OF THE UNITED STATES BATTLESHIP GEORGIA. Illustrated | | 27 |
| RAILWAY STEAMER DUCHESS OF RICHMOND. Illustrated | | 28 |
| CENSUS REPORT OF UNITED STATES SHIPBUILDING | | 29 |
| LETTERS OF INTEREST FROM PRACTICAL MARINE ENGINEERS: | | |
| Walschaert Valve Gear. Illustrated | | 30 |
| Temporary Repair of an Atlantic Liner's Thrust Shaft | | 30 |
| A Series of Accidents. Illustrated | | 31 |
| Economy from the Stokehold | | 32 |
| Explosion of a Water Tube Boiler | | 33 |
| REVIEW OF MARINE ARTICLES IN THE ENGINEERING PRESS | | 34 |
| EDITORIAL COMMENT | | 37 |
| IMPROVED ENGINEERING SPECIALTIES. Illustrated | | 38 |
| TECHNICAL PUBLICATIONS | | 42 |
| COMMUNICATION | | 43 |
| SELECTED MARINE PATENTS. Illustrated | | 44 |

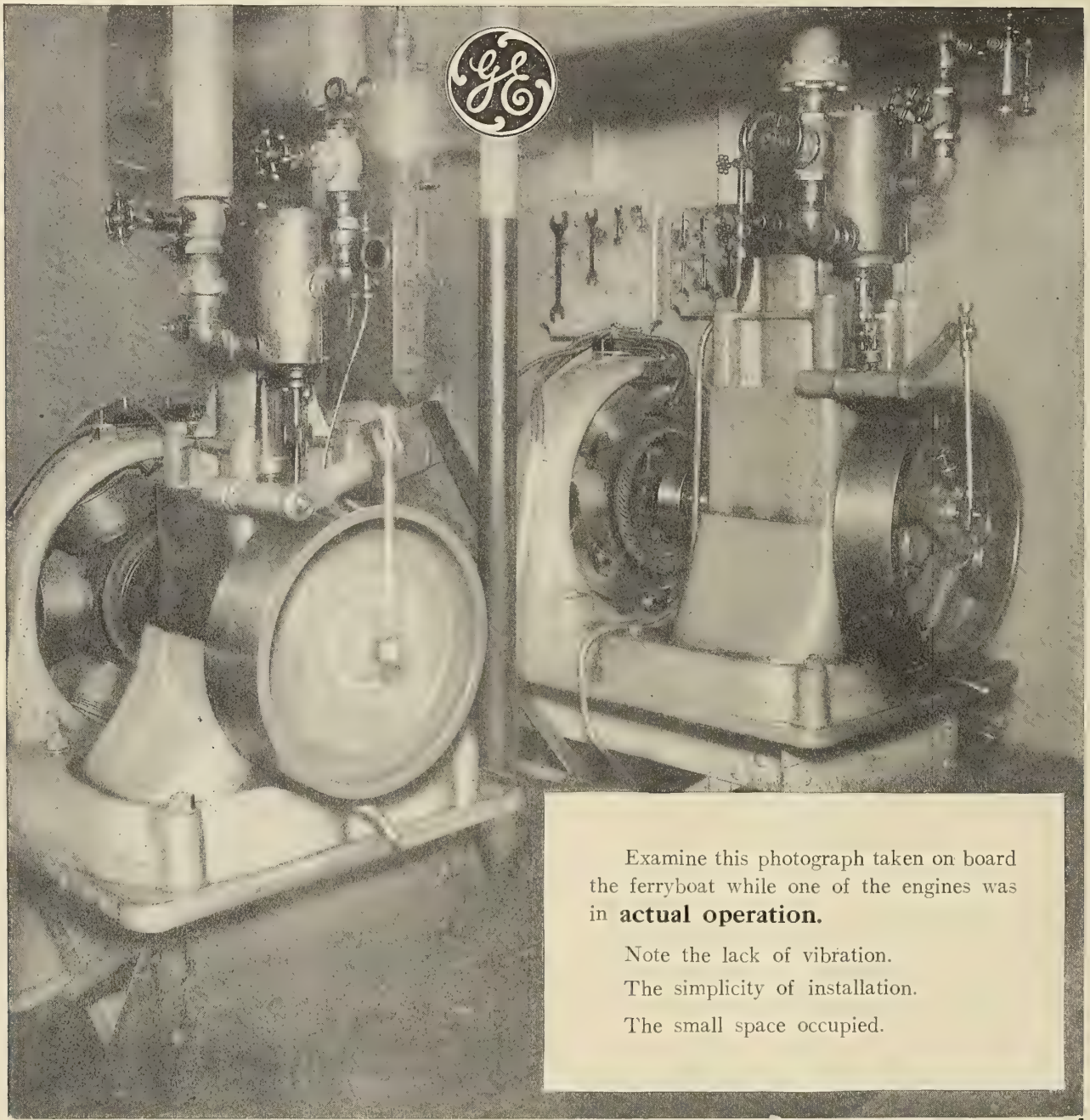

**LONDON:**
**CHRISTOPHER STREET**
**FINSBURY SQUARE, E. C.**

**NEW YORK:**
**WHITEHALL BUILDING**
**17 BATTERY PLACE**

USE COLUMBIAN MANILA ROPE
A Real Rope for Real Work

COLUMBIAN ROPE CO.,
AUBURN, N. Y.

NEW YORK OFFICE: 62 SOUTH STREET
CHICAGO OFFICE: 370 RIVER STREET



Examine this photograph taken on board the ferryboat while one of the engines was in **actual operation.**

Note the lack of vibration.

The simplicity of installation.

The small space occupied.

These Type MP. 5 kw. and 12½ kw. G. E. Marine Sets were supplied on a repeat order for the new ferryboat "Wildwood," operated by the Pennsylvania Railroad between Camden and Philadelphia.

G. E. Marine Sets are made in sizes ranging from 2½ to 100 kw.

Further information on request.

# General Electric Company

Largest Electrical Manufacturer in the World

## Principal Office: Schenectady, N. Y.

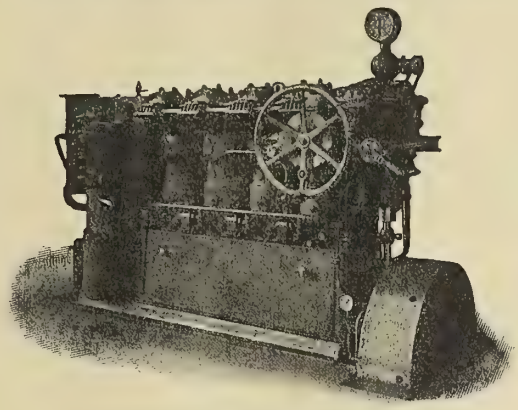
SALES OFFICES IN THE FOLLOWING CITIES:

Baltimore, Md.
Boston, Mass.
Buffalo, N. Y.
Chicago, Ill.
Cleveland, O.
Detroit, Mich. (Office of Selling Agent).
Los Angeles, Cal.
New Haven, Conn.
New Orleans, La.
New York, N. Y.
Philadelphia, Pa.
Portland, Ore.
Richmond, Va.
San Francisco, Cal.
Seattle, Wash.
Mitsui & Co., Tokio, Japan
Bagnall & Hilles, Yokohama, Japan
General Electric Co., (Special Representative), 23 Water St., Yokohama, Japan
General Electric Co. of New York, 83 Cannon St., London, E. C., England

3277

# SULZER DIESEL ENGINES

Most economical Internal Combustion Engines,
Burning cheap Liquid Fuel with high flash point.



Reversible Two Stroke Marine Engine

(Engine itself reversible)

# SULZER BROS.

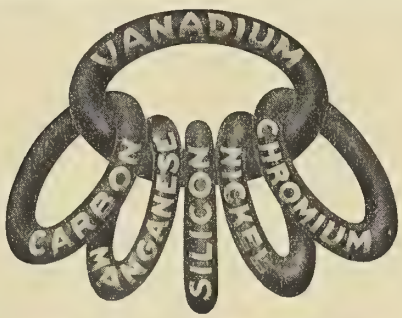
WINTERTHUR, Switzerland.


## TRADE PUBLICATIONS.

### AMERICA

**"100 Buffalo Tales"** is the title of a little book published by the Buffalo Gasolene Motor Company, 1209 Niagara street, Buffalo, N. Y. "In this little book we seek to repeat a few of the tales Buffalo users have told us concerning their engines. These statements are not edited. We simply reprint them as they were told to us, for the most part by men whom we have never seen, and who know us only by the work our engines are doing. Each one of the '100 Buffalo Tales' here told is a really-truly story. They were picked practically at random. There are several hundreds more just as good which we will be pleased to tell you, if you care to hear them. Possibly some of them are the words of your own neighbors, who will repeat to you what they have told us concerning Buffalo efficiency."

**"Nonpareil High-Pressure Coverings"** is the title of a handsomely printed cloth-bound volume of 72 pages, just issued by the Armstrong Cork Company, Pittsburg, Pa. So much has been written in recent years regarding the importance of insulating hot pipe lines, boiler breechings and other heated surface that it is hardly necessary to make extended reference to the subject here. In this, as in any other field, changed conditions require new methods and new materials, or at least the adaptation of old methods and materials to new conditions. Nonpareil high-pressure coverings are new, but not new in the sense of being untried, as they represent the result of years of research directed towards the improvement of the art of heat insulation. The claim is made in this book that, compared with coverings heretofore in general use, the Nonpareil coverings are more efficient non-conductors of heat; that they will withstand temperatures at which the older coverings will calcine and disintegrate: that they possess much greater moisture-resisting power; are just as easy to apply, and are equally reasonable in first cost. In this book is reproduced an extended report on the results of condensation experiments with Nonpareil high-pressure pipe covering, conducted by W. J. Baldwin, M. E., of New York City. The Armstrong Cork Company makes a long line of goods, including life preservers, buoys, yacht fenders, cork floor tiling, cork board for insulating cold-storage rooms, and other cork specialties of every description.


**It holds them all together**

## "AMERVAN" and "MASVAN"

# FERRO VANADIUM

**THE MASTER ALLOYS for producing ANTI-FATIGUE STEEL**

**THE STEEL OF ULTIMATE QUALITY** **Elasticity, Strength, Toughness, Endurance**

VANADIUM Steel has been proved to be the best and, ultimately, the cheapest steel for all classes of high duty service, working against shocks, vibrations and fatigue with extraordinary success and endurance. It forges, machines, welds, case-hardens and lends itself to heat treatment as readily as other steels that do not possess its manifold advantages.

# AMERICAN VANADIUM COMPANY

**318 Frick Building, Pittsburgh, Penna.**

**LARGEST PRODUCERS OF VANADIUM ALLOYS IN THE WORLD**

**THE UNIVERSAL VANADIUM COMPANY, General Agent - New York, London, Paris, Pittsburgh**

**Robb-Brady Scotch boilers** are described in Bulletin No. 3, published by the Robb Engineering Company, Ltd., South Framingham, Mass. The catalogue states that the circulation in these marine boilers is positive and rapid without a pump or other devices, and that the cost is reduced by using two small shells instead of one large one, and by eliminating the flat top combustion chamber and other expensive staying.

**New outside spring calipers** with patent rule attachment are among the great number of tools described in Catalogue 19-L issued by the L. S. Sterrett Company, Athol, Mass. These calipers are so made that zero will always come in line with one caliper point—there is only one easy reading to make. When folded back out of use the rule is held by a snap catch.

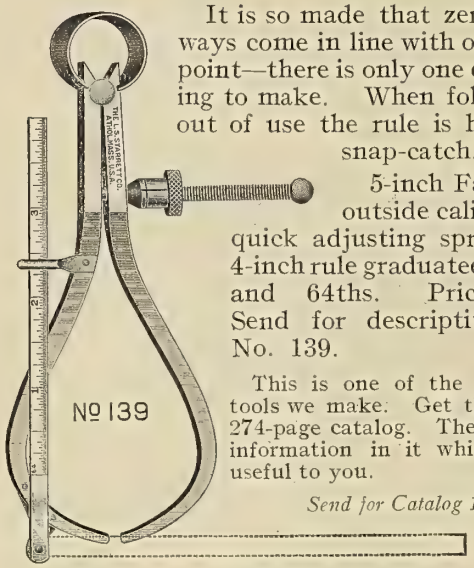
**Wrenches of all kinds** are described in a catalogue issued by J. H. Williams & Company, 63 Richards street, Brooklyn, N. Y. This company makes a special size pocket catalogue for marine engineers, and will send a copy to any of our readers upon application. "The abundant usefulness of the 'Big 6' set doesn't impress you until you are told of their extraordinary capacity. Seven most important bolt sizes (¼ to ¾ inch) and eight most important cap screw sizes (¼ to 1 inch) are in six wrenches. The handy canvas carrier-roll does the rest."

**A very complete catalogue** of brass and iron goods has just been published by the McNab & Harlin Manufacturing Company, 55 John street, New York. This is a profusely illustrated cloth-bound volume of 372 pages. "In presenting this, the eleventh edition of our illustrated catalogue to our customers and the trade, we invite attention to the change in style of some of the old patterns of valves etc., and to the increase in the variety of goods which we manufacture, notably: Extra heavy iron body globe and angle valves, outside screw and yoke iron body gate valve, indicator posts, iron body Jenkins disk valves, stop and check valves combined, oil country iron cocks, sea cocks, dye house swing joints, etc.; also to the fact that we have eliminated goods not of our manufacture which it has been our custom to illustrate in former editions, with the exception of malleable iron fittings and pipe. Steam pressures have increased, making it necessary to meet the new requirements. It has been our aim to keep fully in touch with the needs and demands of the trade, and we have adapted our patterns and machinery to meet this condition. We have endeavored to preserve the character of our goods by keeping them fully up to our well-known standards, believing that there will always be a legitimate demand for high-class standard goods, both in design and quality, sufficient to warrant the advanced price over competition goods, made necessary by the superior quality of the goods. We have increased our plant very materially and installed most modern machinery for turning out our product in the most improved manner and with the least possible delay; and we wish to emphasize the fact that we carry a large complete stock of all staple goods at our factory at Paterson, N. J., but 16 miles from New York, thus insuring prompt shipments of all orders."

**Rockford planers** are described in a catalogue just issued by Joseph T. Ryerson & Son, Chicago, Ill. "Modern methods of shop practice and the present extensive use of high-speed tool steels have caused an important era in the history of machine tools. Degrees of speeds and loads regarded as impossible a few years ago are now being used constantly, and to meet these changed conditions such machines must have extra power and be extremely rigid. Our planers are designed to meet all the conditions influencing modern shopwork and have every facility for high-speed production and accuracy of alignment. The difficulties of the planer problem are many. With machines having a continuous motion in one direction, the problem of speed is simply that of greater strength and necessary belt capacity. But with reciprocating machines, like planers, the problem is that of momentum, which depends directly upon the increased weight and velocity. A few years ago the capacity of carbon steels limited the speed of the forward or cutting stroke; the back or idle stroke being limited by nothing but this momentum, and could be increased to the full capacity of the mechanism to economically reverse. However, with the present use of high-speed steels the limit is only one of efficiency; that is, speed secured without waste of power, injury to mechanism of planer, or sacrificing the quality of the planer's work. Consequently, to-day, planer speed is not limited by cutting speed alone, nor by cutting and return speeds, but by the time taken in the full cycle in which a strong, steady forward stroke, swift, efficient return stroke, and ability to reverse promptly and smoothly are important elements. In producing this planer our aim has been to meet all these problems, and we have kept in mind the fact that weight and power, properly distributed and backed by good workmanship, are the factors that determine the efficiency of machines of this class."


NEW OUTSIDE SPRING CALIPERS

with Patent Rule Attachment




It is so made that zero will always come in line with one caliper point—there is only one easy reading to make. When folded back out of use the rule is held by a snap-catch.

5-inch Fay No. 75 outside calipers with quick adjusting spring-nut—4-inch rule graduated to 32nds and 64ths. Price, $2.25. Send for descriptive folder No. 139.

This is one of the many fine tools we make. Get the Starrett 274-page catalog. There is much information in it which will be useful to you.

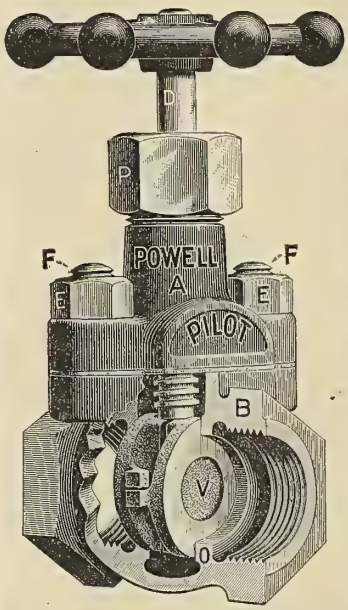
*Send for Catalog 19-L*

THE L. S. STARRETT CO.

ATHOL, MASS., U.S.A.

NEW YORK, 150 Chambers St. CHICAGO, 17 No. Jefferson St.
LONDON, 36 and 37 Upper Thames St., E. C.

The Powell PILOT Brass-Mounted Gate Valve




**A Double Disk** Iron body Gate Valve for medium pressures. The body is strong and compact with heavy lugs carrying stud bolts E. The stud holes, in lugs of bonnet cap A, being accurately drilled to template, permit the valve to be assembled any old way. No matter how you handle it after taking apart, it always fits.

**The Double Brass Disks,** made adjustable by ball and socket back, are hung in recesses to the collar on the lower end of the stem. Stem is cut to a true Acme thread, the best for wear.

The Powell Pilot Gate Valve is also made all iron. For the control of cyanide solutions, acids, ammonia and other fluids that attack brass it has no equal. Send for special circular.

IF YOUR jobber does not have them in stock—ask us who does

THE WM. POWELL CO.

DEPENDABLE ENGINEERING SPECIALTIES.

CINCINNATI

# Lubrication Troubles?

You can cure many or all of these with Dixon's Flake Graphite. Unlike oil, Dixon's Graphite will do no injury to boilers if it reaches them.

Sample 75-C Free.

**JOSEPH DIXON CRUCIBLE CO.**

**JERSEY CITY, N. J.**

## Flax Waterproof Cloth

SUITABLE FOR

**Lighter Covers, Tarpaulins, Boat Covers, Hatch Covers, Side-Cloths, Sail Covers and Dock Covers**

**EDWARD A. BUNKER**

**Established in 1893** **Produce Exchange Annex, D 18, N. Y.**

SEND for a free copy of our 144-page book and learn why our

## Mattresses Cushions Pillows

have been used exclusively so many years by leading steamship companies, yachtsmen and boat owners.

They are buoyant as cork. They are the real thing in comfort.

**Ostermoor & Co.**

**114 Elizabeth Street** **New York**


**A free copy of a catalogue** illustrating and describing mattresses and cushions for yachts and vessels will be sent to all inquirers by Ostermoor & Company, 116 Elizabeth street, New York. The fact that these mattresses and cushions are as buoyant as cork, and are intended not only for comfort but also to be used in case of emergency for life-saving purposes, makes this catalogue of much interest to people connected with vessels of any kind.

**Smooth-On Iron Cement No. 7** is described in a folder published by the Smooth-On Manufacturing Company, Jersey City, N. J. "The great value of Smooth-On is because of its peculiar chemical properties, namely, of metalizing and expanding when metalizing. These properties make Smooth-On a valuable substance in the making of chemical iron cements. To this subject the chemist of the Smooth-On Manufacturing Company has given careful study for eighteen years, and has succeeded in compounding the valuable iron cements known so generally throughout the world as Smooth-On Iron Cement. Smooth-On Iron Cement No. 7, the new Smooth-On product, has the same property as the other Smooth-On cements, of expanding when metalizing, and this makes it very valuable for use in connection with concrete and Portland cement, because, when applied to a crack in concrete or Portland cement the expanding action of the Smooth-On completely fills this crack."

**A steam turbine** for driving direct-current generators is described in pamphlet D-46, published by the De Laval Steam Turbine Company, Trenton, N. J. "This booklet explains the problem involved in selecting types of steam turbines; that is, the problem of reaching a compromise between the tremendous velocity of spouting steam and the comparatively moderate speeds demanded in the driven machinery, such as direct-current generators, centrifugal pumps and blowers, and for belt and rope driving. The pamphlet compares the several methods of compromise which have been adopted, such as pressure and velocity staging and combinations of the two, and describes a fourth method, which permits the turbine to be built with the number of stages best adapted for the capacity and to secure substantial and reliable construction, and to run at the speed most favorable for high efficiency, while the driven machinery may run at any speed required. This is the greatest advance in steam turbines made for many years, and you should be familiar with it."

**Flanged gaskets** are described in the latest number of the "J-M Packing Expert," issued by the H. W. Johns-Manville Company, 100 William street, New York. "J-M Permanite gaskets are cut from J-M Permanite sheet packing No. 60. They make permanently tight joints that require no following up, successfully pack surfaces where even copper gaskets have failed, and consequently enjoy well-deserved popularity in scores of the largest power plants where they are giving unsurpassed satisfaction under any and all conditions. The high heat and chemical resisting qualities of J-M Permanite flange gaskets are due to the fact that they are cut from J-M Permanite sheet, which latter is made from the highest obtainable quality of long-fiber asbestos. By an exclusive formula, entirely our own, certain compounds are combined with the asbestos which make the resultant packing highly resilient and extremely pliable. Asbestos is a practically indestructible material, hence J-M Permanite flange gaskets resist highest temperatures and pressures, withstand the action of fluids and chemicals, never burn or blow out, and do not stick to the flanges."

**Conoidal fans** are described in Catalogue No. 190, published by the Buffalo Forge Company, Buffalo, N. Y. "The Buffalo "Conoidal" fan derives its name from the prevalence of conical shapes in its design. The inlet is conical; the blast wheel forms the frustum of a cone, and the blades are curved over the tapering surface of a cone. Although it is a comparatively short time since this fan was put on the market by us in its present perfected shape, its superiority over older types has already been clearly demonstrated. Three great advantages combine to place it ahead of all others: First, the design itself, which, as will be seen from the following pages, is essential to the highest efficiency. Secondly, the great structural strength and rigidity to which this design so readily lends itself. And last, but not least, its correct proportions, in which we have come nearer perfection than any other manufacturer. Our claims of superiority for these fans are based, not only on tests made by ourselves, but upon competitive trials conducted by competent engineers exclusively in the interest of firms employing them, who have chosen from the best that the market affords and picked from among these the 'Conoidal' fan for their own use, as the one type which shows the greatest advantages in efficiency, strength and reliability."

## TRADE PUBLICATIONS

### GREAT BRITAIN

**"A patent inclosed engine** for power, traction and lighting" is the subject of a catalogue just published by W. Sisson & Company, Gloucester. This engine is double-acting, self-lubricating, silent running, has large overload capacity, automatic expansion governing, low steam consumption.

**Dobbie McInness, Ltd.,** 57 Bothwell street, Glasgow, have issued circulars of their various marine specialties, among which they specially call attention to their McInness-Dobbie patent indicators for steam and gas engine work, of which you will further observe we have several forms for continuous and similar purposes. Also, McInness-Dobbie improved Bourlon gages, Messenger's furnace deformation indicator, Clyde furnace indicator, Hopkinson flashlight indicator, Sellers portable dynamometer, etc., etc. "A booklet for which there is quite a demand is our 'Commercial Value of Indicator Diagrams.'"

**Heath & Company, Ltd.,** Crayford, London, are anxious to send shipowners a special catalogue dealing with their latest patented standard binnacles. The list shows binnacles suitable for every type of vessel from the largest to the smallest, and embraces all the improvements to date; also sounding machines which are made to the Kew standard. A glance through their lists will prove of great service when drawing up specifications for new ships or replacements. To insure getting first-class instruments on board specify that they must be made by this firm, as all their "Hezzanith" instruments are guaranteed. Application should be made at once for this useful book of reference. The firm issues seven large catalogues: No. 1, Sextants; No. 2, Binnacles and Compasses; No. 3, Barometers and Clocks; No. 4, Logs, Sounding Machines, Lamps, etc.; No. 5, Thermometers and Thermographs; No. 6, Surveying Instruments; No. 7, Mathematical Instruments and Sundries. Heath & Company, Ltd., have been established at Crayford, London, since 1846, and are contractors to many of the governments.

**Steel sheets,** black and galvanized, plain and corrugated, are the subject of a pamphlet published by the Bowesfield Steel Company, Ltd., 110 Cannon street, London, E. C.

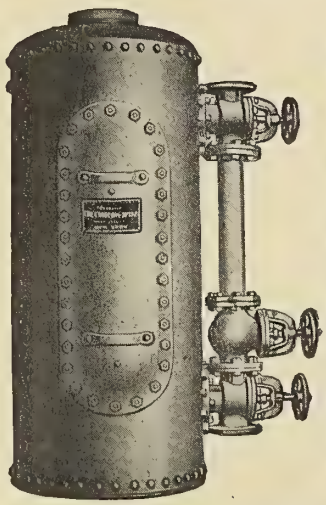
**Watertube boilers,** accessories and automatic stokers are described in a handsomely illustrated catalogue of 28 pages published by the British Niclausse Boiler Company, Ltd., Caxton House, Tothill street, Westminster, S. W. The Niclausse boiler is a watertube boiler of the large tube type, and has been in successful operation, both for marine and land purposes, for the past twenty years. Over 3,000,000 horsepower are now in use, which have been supplied to British, French and other gocernments.

**Pickerings, Ltd.,** Globe Elevator Works, Stockton-on-Tees, have published an excellent catalogue of pulley blocks, chain hoists, overhead runways, friction hoists, winches, goods and passenger lifts, cranes and other lifting appliances, illustrated, prices and other particulars of which are given in most cases. The list also states prices of shafting, plummer blocks, pulleys, machine molded gears and Pickering governors. In order to ensure the safe working of lifts, cranes and other machinery, Messrs. Pickerings employ a staff of experienced men periodically to inspect and report on such machinery.

**A catalogue of steam-proof flare lamps, hand-lamps, etc.,** is published by Imperial Light, Ltd., 123 Victoria street, London, S. W. "The introduction of Imperial lights has revolutionized the lighting of open spaces. These lights are more handy, efficient and economical than any other form of flare, and no one who is dependent from time to time upon portable lights can possibly afford to be without them. We are now supplying Imperial lights to every country in the world. They have been subject to the severest tests under every conceivable condition, and the general opinion of our thousands of customers is that Imperial lights are without exception the very best for the purposes for which they are designed. During the last few years the sales of Imperial lights have increased beyond our most sanguine anticipations, and our success is entirely due to the simplicity and efficiency of design, coupled with the economy in initial cost and maintenance. Imperial acetylene flare lights and hand-lamps, which are fully protected by British and foreign patents, are dealth with in detail in this catalogue, and the illustrations are from photographs of actual lights of each type."

**Ship Draftsmen Required.**—Capable, neat and thoroughly


# Reilly Multicoil Heaters



and **Evaporators** are **in stock** at the shops, Pier B, Jersey City, awaiting your rush orders. Coiled, flexible copper tubes, ground union joints (no expanded ends), and the Reilly manhole door, giving access to all interior parts, give the marine engineer an auxiliary which **saves coal, increases Condenser capacity,** and needs **no repairs.**

**Send your vessel to our pier for her next repairs; and install the auxiliaries at the same time.**

# Reilly Multicoil Evaporators Improved Type

?

**Do you want to know?**

## THE GRISCOM-SPENCER COMPANY

**90 WEST STREET, NEW YORK.**

**FORMERLY THE JAMES REILLY REPAIR AND SUPPLY COMPANY.**

## BUSINESS NOTES

### AMERICA

THE ROBB ENGINEERING COMPANY, LTD., South Framingham, Mass., reports recent sales of horizontal return-tube boilers as follows: Charles A. Luddin, Chicopee, Mass.; four to McLean & Cousens, Boston, Mass.; Adams Bros., Pittsfield, Mass.; J. P. McDonald, Woburn, Mass.; Brown & Simmonds, Somerville, Mass.

THE NEW YORK National Motor Boat Show for 1912 will be held in the 69th Regiment Armory, on 25th and 26th streets, New York City, from Feb. 17 to 24, inclusive. On account of the sale of the Madison Square Garden the National Association of Engine and Boat Manufacturers has been obliged to look elsewhere for an exhibition hall. The association states that it has found the armory to be well suited for the purpose, and that it affords 25 percent greater area than the space formerly used in the Madison Square Garden.

THE KERR TURBINE COMPANY, Wellsville, N. Y., states that over 700 of its machines, aggregating more than 50,000 horsepower, are in active service, and that more unfilled orders are now booked than at any previous time in the history of the company. Although the plant has been materially enlarged, a night shift has been necessary for the past two and a half years. Among recent orders are the following: Two 75-kilowatt and one 35-kilowatt lighting sets to American Shipbuilding Company for the new steamer *City of Detroit;* one 350-kilowatt turbo-alternator for the Brooklyn refinery of the Standard Oil Company; two 2,800-gallon per minute turbo-pump units for Tidewater Oil Company; two 75-kilowatt lighting sets for water-works service, city of Chicago; one 60 brake-horsepower turbo-generator with Prony brake attachment for the University of Melbourne, Australia (this unit takes steam at 200 pounds gage, with 200 degrees superheat, and exhausts to 28 inches vacuum); one 215-horsepower turbo-blower for People's Gas Light & Coke Company, Chicago (the tenth set of this size ordered by these people); two underwriter fire pumps driven by 200-horsepower Kerr turbines, for Stieger & Sons piano factory, Stieger, Ill.; one fire pump, driven by 265-horsepower Kerr turbine, for B. M. Osbun Company, Chicago. This last-named will be the only turbine-driven fire pump in the city of Chicago.

BOILERS OF THE STEAMSHIP *Melrose,* of the New England Coal & Coke Company, Boston, Mass., have been equipped with the Ross-Schofield system of circulation. This is the first of three vessels owned by this company for which this system, manufactured by the Ross Schofield Company, 39 Cortlandt street, New York, has been ordered.

C. G. COX, formerly connected with the General Electric Company, has become sales manager of the Busch-Sulzer Bros.—Diesel Engine Company, with headquarters at the general sales offices, South Side Bank building, St. Louis, Mo. Mr. Cox will devote himself to the marine type as well as to the stationary engines of this company.

R. SANFORD RILEY, of Providence, R. I., who as president of the American Ship Windlass Company developed the Taylor stoker, has sold out his interest there and organized the Sanford Riley Stoker Company to exploit a new self-cleaning underfeed stoker.

SIROCCO FANS, built by the American Blower Company, Detroit, Mich., have been installed on a large number of ships recently built by the Great Lakes Engineering Works, Detroit, Mich. The car ferry *Chief Wawatam,* belonging to the Mackinac Transportation Company, and built by the Toledo Shipbuilding Company, is equipped with two Sirocco fans. The *City of Detroit III.,* now under way at the yards of the Detroit Shipbuilding Company, is fitted with three forced draft Sirocco fans with Type E. engines. "Some idea of the extent of our marine business can be gained from the fact that we have something over 320 Type 'A' and 'E' engines installed on boats. Our records in this connection are not entirely complete, as it is impossible to trace the destination of apparatus in every instance. We have, however, record of 132 engines supplied for direct connection to generators, 146 for operating mechanical draft apparatus and 45 for miscellaneous uses—such as driving refrigerating machines, operating ash hoists, etc. Of these, 218 are installed on boats operating on the Great Lakes, 35 on ocean-going vessels or those operating along the coasts, and 70 on boats on rivers, canals, etc. This latter item includes 20 engines furnished for dredges on the Isthmus of Panama."


# COBBS HIGH PRESSURE SPIRAL PISTON
## And VALVE STEM PACKING

IT HAS STOOD THE TEST OF YEARS AND NOT FOUND WANTING

IT IS THE MOST ECONOMICAL AND GREATEST LABOR SAVER

**WHY?** Because it is the only one constructed on correct principles. The rubber core is made of a special oil and heat resisting compound covered with duck, the outer covering being fine asbestos. It will not score the rod or blow out under the highest pressure.

**NEW YORK BELTING AND PACKING CO.** LIMITED

**91 and 93 Chambers Street, NEW YORK**

**LONDON, E. C., ENGLAND, 11 Southampton Row**

CHICAGO, ILL., 130 WEST LAKE STREET
ST. LOUIS, MO., 218-220 CHESTNUT STREET
PHILADELPHIA, PA., 821-823 ARCH STREET
SAN FRANCISCO, CAL., 129-131 FIRST ST., OAKLAND
BOSTON, MASS., 232 SUMMER STREET
PITTSBURGH, PA., 420 FIRST AVENUE
PORTLAND, ORE., 40 FIRST STREET
SPOKANE, WASH., 163 S. LINCOLN STREET

## BUSINESS NOTES

### GREAT BRITAIN

LEITH DOCK COMMISSIONERS have placed contracts for harbor equipment which include an hydraulic swing bridge from Armstrong, Whitworth & Company, and a crane of 110 tons capacity from Cowans, Sheldon & Company. The crane will be capable of lifting to a height of about 80 feet above water level, and will project 42 feet from the face of the quay. The crane itself will cost £8,000, and the foundations and sidings about £2,800.

RECENTLY some new plant, says *The Times*, has been erected at the electrical engineering laboratories of the Liverpool University, with the object of facilitating tests on certain types of electrical machinery, and the new Harrison-Hughes engineering laboratories, which are an addition to the University equipment, are being supplied with plant for experimenting in marine engineering, in which special attention is devoted to the economic aspect of liquid fuel. The electrical laboratories have been equipped with a complete installation of apparatus for the purpose of wireless telegraphy, the gift of Sir W. P. Hartley. A complete set of receiving and transmitting appliances is provided to afford direct communication with the Eiffel Tower and the North of Germany. At present the University is in touch with vessels within a radius of 50 miles. The installation is a full-scale one, similar to those used for commercial purposes, but it will be applied solely to the teaching of students and to research and experiment. The feature of the Harrison-Hughes engineering laboratories is the provision for internal-combustion engines. The department has recently been equipped with a 50-horsepower Diesel engine and a 25-horsepower Blackstone engine, both of which consume crude oil, and are of the type that is beginning to be employed for the propulsion of ships. A suction gas-producer of 60 horsepower for bituminous fuel is being installed for use in conjunction with a gas engine, both of which have been constructed by Crossley Bros. Provision is also made for research in mining engineering, and particularly in connection with the transmission of power underground. In this connection a powerful air-compressing plant will be provided.

WE LEARN from the Pulsometer Engineering Company, Ltd., of Reading, that they have received a diploma of honor and a gold medal for their "Geryk" vacuum pumps, shown at the International Exhibition at Turin. The diploma of honor is the second highest award, being only surpassed by the grand prix.

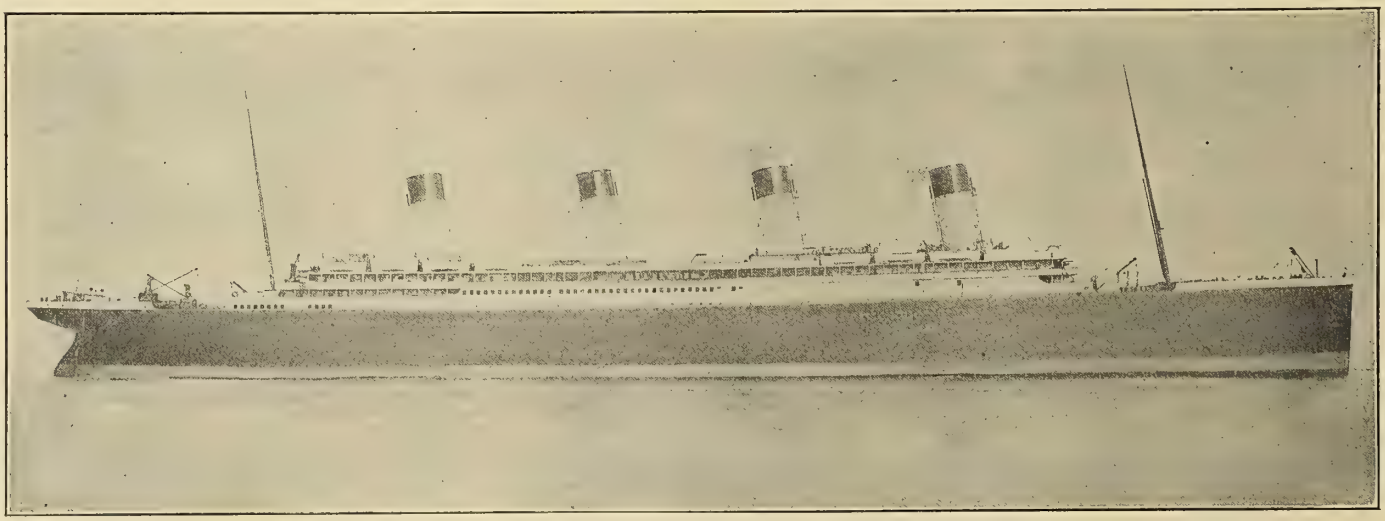
THE WELL-KNOWN FIRM of Joseph Kaye & Sons, Ltd., South Accommodation Road, Leeds, and 93 High Holborn, London, W. C., have again secured the whole of the contract for the supply and delivery of their patent seamless serrated oil cans to H. M. naval establishments for the next three years ending 1914, fitted with their latest patent thumb button (Patent No. 2775, Feb. 3, 1911), and, as previously announced, this invention dispenses with the thumb button being soldered to the valve spindle, which is considered to be a great improvement, as it is claimed to be impossible to detach the new thumb button and leave only the bare end of the valve spindle for the thumb to press against, as hitherto. Messrs. Kaye have supplied 44,000 of their patent serrated oil cans to previous contracts for H. M. navy, but this is the first contract under the new patent.

PROBABLY THE MOST INTERESTING example of oil-driven vessels is *Jutlandia*, which was built recently by Barclay Carle & Company, Whiteinch. This twin-screw vessel was built to the order of the East Asiatic Company, of Copenhagen, and is 384 feet in length, 53 feet 3 inches in breadth, 30 feet in depth, 23 feet 6 inches in draft, of 10,000 tons displacement, 7,000 tons deadweight, and 5,000 tons gross. She will be supplied by the builders with two sets of Diesel oil engines, capable of developing 3,000 indicated horsepower. She will have three masts, and the fumes from the engine room will be led up inside the mizzenmast and exhausted at a height of 48 feet above the deck, so that a funnel is not required even for exhaust purposes. The siren, on the mainmast, will be operated by compressed air. Perhaps the most noticeable feature of the design is that the machinery space is only about a third of that which would have been necessary for steam engines, and that the absence of boilers and boiler casings leaves a large amount of hold space for the storage of cargo, and far more deck space for the use of passengers than would be possible if the vessel were fitted with steam engines. It is expected that the *Jutlandia* will run trials next month.


**WELIN DAVIT AND LANE & DE GROOT CO.**

*305 Vernon Ave., Long Island City, N. Y.* CONSOLIDATED *Tel. Greenpoint 2581*

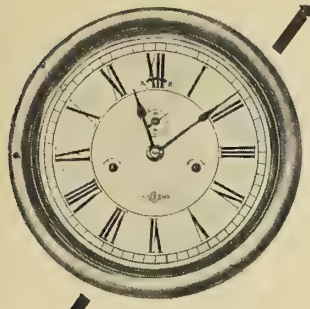
*Manufacturers of* **Welin Quadrant Davits,** *the only reliable boat-launching apparatus on the market; manufactured in twenty distinct types and sizes.* **Over 4000 Davits now in use.**



Steamships "OLYMPIC and "TITANIC" fitted throughout with Welin Quadrant Davits

*The* **Lane & De Groot Life Boats** *and* **Life Rafts** *are the Standard of quality.*
*Also builders of bronze, steel and wooden launches and other marine appliances.*
*The famous* **A-B-C Life Preservers.** *One-third lighter and smaller than any other belt made.*
*All our appliances approved by U. S. Inspectors.*

*London House:* **THE WELIN DAVIT & ENGINEERING CO., LTD.** *5 Lloyd's Avenue, London, E.C.*



# Marine Clocks

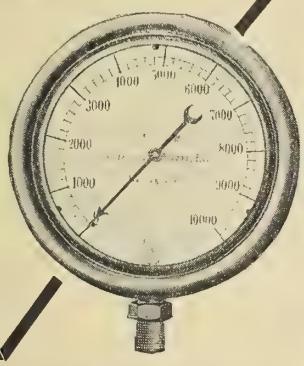
We carry an enviable line of marine clocks. They are of various standard movements, and in appearance they are exceptionally handsome.

Write for prices, which you will find moderate.

# Gauges

Among the S. & B. line of Gauges for pressure and vacuum may be found an instrument for every conceivable purpose. They are moderate in price, though of highest quality. They are all described in our Catalogue M-1.

*Write for a copy*



**The Schaeffer & Budenberg Mfg. Co.**

**BROOKLYN, N. Y.**

**Chicago Washington Pittsburgh** (44)



# ZYNKARA AND ZYNKOYDUM.

**Good and economical Preservatives of Marine Steam Boilers against the damaging effects of pitting, corrosion and undue incrustation.**

**THE ZYNKARA COMPANY, LIMITED,**

36 SIDE, NEWCASTLE-ON-TYNE, ENG.


A NEW SURVEYING VESSEL, designed by Gray & Brace, naval architects, of London, embodies some interesting and novel features. The ship is a little over 200 feet long. She is rigged as a four-masted schooner, and auxiliary power is provided by a gas engine situated aft. The producers and scrubbers are close to the engine, in large, well-ventilated spaces. Anthracite coal is to be used. The accommodation for the staff of surveyors includes a number of large cabins. The ship is lighted by means of electricity, and is ventilated on the well-known thermo-tank system. The nature of the surveying which the vessel will do has not been disclosed, but part of the vessel's equipment is a complete trawling gear similar to that used by the largest Grimsby trawlers.

THE TURBINE ERECTING SHOPS which have been added to the engineering works at Stobcross of the London & Glasgow Shipbuilding & Engineering Company are, says the *Glasgow Herald,* well equipped with turning, planing and other machine tools required for heavy Admiralty work. Three new overhead, three-motor electric cranes have been installed recently. These cranes are each of 60 tons capacity, and have been subjected to test loads of 72 tons. Two of them, in the turbine erecting shop, are of 47 feet span, and the third, in the machine shop, is of 42 feet 6 inches span. The height to crane rails from the floor of the shops is 49 feet. The shops themselves are 300 feet in length. The operations of lifting, cross-travel and long-travel are effected at speeds which indicate the high efficiency of the equipment. The full load of 60 tons is lifted at a speed of 5 feet per minute, and a load of 25 tons is lifted at a speed of 11 feet 6 inches per minute; while for lighter loads the lift speed is from 12 feet to 15 feet per minute. The speed of cross-travel is 60 feet to 90 feet per minute, and of long-travel 200 feet to 240 feet per minute. The hoisting motor is of 33½ brake-horsepower and 450 revolutions per minute. The cross-travel motor is of 10 brake-horsepower, and 475 revolutions per minute, while the long-travel motor is of 275 brake-horsepower and 450 revolutions per minute, all wound for an electromotive force of 500 volts continuous current. The controllers are of the reversing tramway type, with regulating metallic resistances and hand levers. A powerful automatic electric brake is fitted to the motor spindle, and there is also a mechanical brake fitted to the second motion shaft, working from the cage by foot lever. The hoisting controller is arranged on the lowering side, with five-brake contacts, so that on these positions the motor is short circuited from the main, and works as a generator through resistance, thus preventing the load from accelerating and causing damage to the armature. The crab is built of mild steel plates and angles, and has mild steel shafts for the different motions, running in adjustable bearings, bushed with gunmetal, the whole being mounted on four double-flange mild steel rail wheels, 18 inches in diameter. The hoisting, as well as the cross and long-travel gear, is all of steel and machine-cut from solid metal. The main structures of the cranes, consisting of cross girders and end carriages, are built, box-section, of mild steel plates and angles, the girders being 4 feet 1 inch deep at the center of the span. The end carriages are each fitted with two rail wheels, 3 feet in diameter, having centers of cast iron, with double-flanged steel tires shrunk on. The axles are of steel, and run in cast iron bearings, spigoted and bolted to the webs of the carriages. The bearings are bushed with gunmetal, and are of the self-oiling type. The lifting tackle consists of eight falls of special steel wire rope.


# Boiler, Ship and Structural Rivets

V ON EVERY HEAD

Unbroken After 15 Years' Test.

**Hold some Reliable Maker Responsible for the Quality of Rivets You Drive**

**Coupler and Air Brake Pins**

**STANDARD SPECIFICATIONS**

Booklet "Scientific Facts" Free Upon Application.

Largest Rivet Manufacturers in the world—40,000 kegs in stock.

**The Champion Rivet Co.,** CLEVELAND, OHIO, U. S. A.

LANCASTER & TONGE, LTD., Pendleton, Manchester, have, we understand, received an order from the Commonwealth Portland Cement Co., Sydney, New South Wales, for four M. S. piston rods, two 24⅜-inch C. I. junk cover pistons complete with rings and coil, two 45⅜-inch C. I. junk cover pistons complete with rings and coil, two sets 5⅜-inch duplex metallic packings, two sets 4⅛-inch duplex metallic packings, two sets 5⅜-inch single metallic packings, two sets 4⅛-inch single metallic packings, two sets 24⅜-inch piston rings and serpent coils as spares, two sets 45⅜-inch piston rings and serpent coil as spares, eight sets spare parts complete for metallic packings (one set each).

ENGINES OF NEW ALLAN LINERS.—In the two steamers which are being built at Fairfield and Dalmuir, respectively, for the Allan Line, says *Engineering,* the Frahm anti-rolling tank system will be adopted. There will be four screw shafts arranged in three engine rooms, and the shafts will be driven by turbines of the Parsons type, consisting of one high-pressure ahead, one intermediate-pressure ahead, and two low-pressure ahead turbines, and two astern turbines. The two astern turbines will be incorporated with the low-pressure ahead turbines, and will be on the inner lines of shafting. The power will be divided as nearly as possible over the four shafts, and each shaft will be fitted to work independent of the others by a suitable arrangement of pipes and valves. The total power is to be 19,000 shaft-horsepower. The boilers are to be worked under Howden's forced draft, and they will be arranged so that oil fuel may be used, if it is found economically possible to do so. There will be six double-ended and four single-ended boilers, the former being 16 feet 9 inches in diameter by 22 feet long. For the carriage of provisions refrigerating machinery and cold stores with a capacity of 70,000 cubic feet are arranged for. It will thus be recognized, it is added, that the two ships, which are to be classed under the British Corporation for the Survey and Registry of Shipping, promise to be thoroughly adapted for the Canadian service, alike in speed, comfort and cargo capacity.

IN CONNECTION with this year's Cutlers' Feast at Sheffield, Cammell Laird & Company, Ltd., issued an extremely well-got out brochure which includes photographs and a short description of their works. The guests of the Master Cutler paid an interesting visit to these works. The Cyclops Works, where the head offices of the company are situate, cover an area of 11 acres, and are intersected by the Midland Railway Company. The company has the advantage of its own private sidings. A large portion of these works is confined to the treatment and finishing of armor plates, for which purposes the department is provided with specially designed furnaces, oil tanks, douches, hydraulic presses and other appliances. There are also nine machine shops, where the plates are machined and ground. This department is capable of producing annually up to 15,000 tons of finished armor of the latest type, ranging from 2 inches up to the thickest plate demanded by naval contractors. The remaining portion of the Cyclops Works is confined to the manufacture of railway axles and general forgings, crucible and special high-speed tool steels and files and rasps, also nickel steel, deck and bullet-proof plating for all kinds of war vessels and for artillery and other purposes. The average annual outputs (other than armor) are 8,000 tons of nickel-steel plates and deck plates, 15,000 tons of axles and forgings, 1,500 tons of crucible steel, and 125,000 dozen files and rasps. As in the case of Cyclops Works the Grimesthorpe Works adjoin the Midland Railway Company's line. These works cover 26 acres, and embrace the manufacture of Siemens-Martin steel on the open-hearth principle for all purposes. At these works the whole of the steel is produced for the manufacture of armor and general purposes. The other departments at Grimesthorpe may be briefly enumerated as follows: Steel foundry, for the manufacture of ship and general castings of the heaviest class for engineering purposes, also mining castings. Press shops, for the manufacture of gun and other forgings of all descriptions. Machine shop for finishing castings, forgings and other materials produced. Two tire plants for the manufacture of engine, carriage and wagon tires, and angle-rings for boiler purposes, Armor plate rolling department. Spring department, where the manufacture of all classes of railway and other springs is carried on. Projectile department and iron foundry. The annual output of the Grimesthorpe Works is approximately 100,000 tons of steel ingots for armor and other uses, and for the general purposes of the engineering industry, and 10,000 tons of steel castings. From the steel produced the company has an approximate annual output of 10,000 tons of gun and other forgings, 15,000 tons each of tires, buffers and springs, and over 100,000 projectiles of various types.


# FIFTEEN YEARS' ADVANCE IN SHIPBUILDING

This magazine will be fifteen years old in March, and will celebrate the event by publishing

## *A FIFTEENTH ANNIVERSARY NUMBER*

Dr. W. F. Durand will tell of the **fifteen years' advance in the design of marine machinery,** including boilers, propelling engines, auxiliaries, etc.

Professor C. H. Peabody will write on the **fifteen years' advance in hull design and equipment,** including deck fittings, cabin accommodations, etc.

The authors' names speak for the value of these articles from an engineering point of view.

In addition, there will be other important articles, all of which will be splendidly illustrated, making the March number of International Marine Engineering a most valuable one editorially, and a splendid one for advertising.

**INTERNATIONAL MARINE ENGINEERING**

**17 Battery Place, New York**

**31 Christopher St., Finsbury Square, London, E. C.**

# MARINE SOCIETIES.

**AMERICA**

**AMERICAN SOCIETY OF NAVAL ENGINEERS.**
**Navy Department, Washington, D. C.**

**SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS**
**29 West 39th Street, New York.**

**NATIONAL ASSOCIATION OF ENGINE AND BOAT MANUFACTURERS.**
**314 Madison Avenue, New York City.**

**UNITED STATES NAVAL INSTITUTE.**
**Naval Academy, Annapolis, Md.**

**GREAT BRITAIN**

**INSTITUTION OF NAVAL ARCHITECTS.**
**5 Adelphi Terrace, London, W. C.**

**INSTITUTION OF ENGINEERS AND SHIPBUILDERS IN SCOTLAND.**
**39 Elmbank Crescent, Glasgow.**

**NORTHEAST COAST INSTITUTION OF ENGINEERS AND SHIPBUILDERS.**
**Bolbec Hall, Westgate Road, Newcastle-on-Tyne.**

**INSTITUTE OF MARINE ENGINEERS, INCORP.**
**58 Romford Road, Stratford, London, E.**

**GERMANY.**

**SCHIFFBAUTECHNISCHE GESELLSCHAFT.**
**Technische Hochschule, Charlottenburg.**

---

**MARINE ENGINEERS' BENEFICIAL ASSOCIATION**

NATIONAL OFFICERS.

President—Wm. F. Yates, 21 State St., New York City.
First Vice-President—Art Hyde, 9115 Willard Ave., N. W., Cleveland, Ohio.
Second Vice-President—Geo. H. Bowen, Port Huron, Mich.
Third Vice-President—Charles N. Vosburgh, 6323 Patton St. New Orleans La.
Secretary—Geo. A. Grubb 1040 Dakin St., Chicago, Ill.
Treasurer—A. L. Jones, 38 Avery Ave., Detroit, Mich.

ADVISORY BOARD.

W. B. Hayden, Washington, D. C.
Wm. L. Bridges, 784½ Twelfth St., Milwaukee, Wis.
Frank J. Houghton, Port Richmond, S. I., N. Y.

---

**DIRECTORY OF GRAND COUNCIL, N. A. OF M. E. OF CANADA, FOR 1911.**

GRAND OFFICERS.

Grand President—Thos. J. S. Milne, 302 University Ave., Kingston, Ont.
Grand Vice-President—Thos. Theriault, Levis, P. Q.
Grand Secretary-Treasurer—Neil J. Morrison, P. O. Box 238, St. John, N. B.
Grand Conductor—John A. Murphy, Midland, Ont.
Grand Doorkeeper—D. J. Murray, Victoria Rd., Dartmouth, N. S.
Grand Auditors—A. J. Woodward, Toronto, Ont.; E. J. Riley, Owen Sound, Ont.

---

**AMERICAN ASSOCIATION OF MASTERS, MATES AND PILOTS.**

NATIONAL EXECUTIVE COMMITTEE.

National President—John H. Pruett, 423 Forty-Ninth St., Brooklyn, N. Y.
National First Vice-President—Wm. A. Westcott, 1 Ferry Building, San Francisco, Cal.
National Second Vice-President—A. R. Mackey, 8 Wood St., Pittsburg, Pa.
National Third Vice-President—Charles Davis, St. Louis, Mo.
National Treasurer—A. B. Devlin, 21 State St., New York. Also secretary pro tem.
National Counsel—L. B. Dow, 21 State St., New York.

---

TWENTY-FOUR THOUSAND POUNDS has been apportioned by the Italian government for dredging the entrance channel at Marsala to a depth of 6 meters, and for dredging a zone 300 meters long and 150 meters wide in the east basin to a depth of 5.5 meters. A contract for lengthening the mole by 165 meters on the west side of the harbor has been let at a cost of £40,000, and it is expected that the work will occupy four years.

# HELP AND SITUATION AND FOR SALE ADVERTISEMENTS

**No advertisements accepted unless cash accompanies the order.**

***Advertisements will be inserted under this heading at the rate of 4 cents (2 pence) per word for the first insertion. For each subsequent consecutive insertion the charge will be 1 cent (½ penny) per word. But no advertisement will be inserted for less than 75 cents (3 shillings). Replies can be sent to our care if desired, and they will be forwarded without additional charge.***

---

**Ship Draftsmen Required.**—Capable, neat and thoroughly experienced in warship construction; also with knowledge of piping, plumbing and ship details. Address, stating age, experience, salary desired, and date of commencement of duties, *Chief Hull Draftsman,* Fore River Shipbuilding Company, Quincy, Mass., U. S. A.

---

THE LARGEST SEA-GOING MOTOR BOAT under the Belgian flag has recently been constructed at Amsterdam to the order of the Société Anonyme d'Armement, d'Industries et de Commerce for the conveyance of oil in bulk. She has a length of 395 feet, a width of 53 feet and a depth of 29 feet, and has been fitted with two motors capable of developing 1,100 horsepower each.

WE UNDERSTAND that Messrs. Richardsons, of Billiter Square buildings, London, E. C., have just been appointed London representatives of Messrs. Tait & Company, Kobe, Japan, who are opening an engineering department. Firms desirous of finding a market for their manufactures in Japan and the East should send their catalogues in duplicate to Messrs. Richardsons' export department.

S. T. TAYLOR & SONS, of Scotswood-on-Tyne, covered the boilers of the steamship *Sir Robert Coverdale* and the steamship *Roselands* with their "Tynos" non-conducting composition. They also have covered the boilers and steam pipes of the steamship *Japanese Prince* with their "Tynos" non-conducting composition, and the boiler bottoms with their "Tynos" patent mattresses.

THE BOUND VOLUME

OF

International Marine Engineering

FOR

January-December, 1911, is now ready for delivery

PRICE, $4.00 (16/-)

Buyer Pays Express Charges

NEW YORK
Whitehall Building, 17 Battery Place

LONDON
31 Christopher Street, Finsbury Square, E. C.

# ECLIPSE SECTIONAL RAINBOW GASKET

CAN BE ADAPTED TO ANY SHAPE AND MAKE ANY AND ALL SIZES OF GASKETS.

ALL PIECES NO MATTER HOW SMALL CAN BE FORMED ON THE METAL TUBES INTO A SECTIONAL GASKET. NO WASTE OR UNSALABLE STOCK.

WILL WITHSTAND THE HIGHEST PRESSURE.

PATENTED AND MANUFACTURED EXCLUSIVELY BY

## PEERLESS RUBBER MANUFACTURING COMPANY

## 16 WARREN ST., NEW YORK

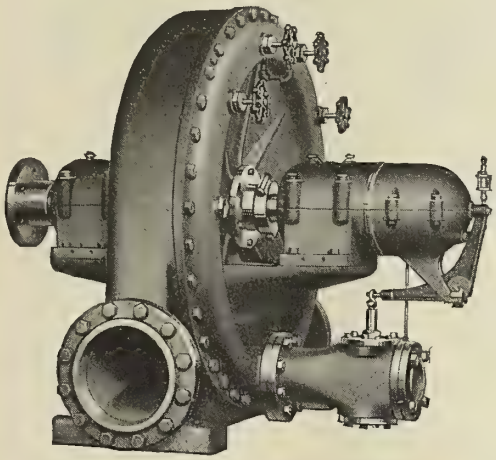
DETROIT, MICH.:-16-24 WOODWARD AVE.
CHICAGO, ILL.:- 200-208 SO. WATER ST.
PITTSBURGH, PA.:- 425-427 FIRST AVE.
SAN FRANCISCO,-39-51 STEVENSON ST.
SPOKANE, WASH.:- RAILROAD & STEVENS STS.
SALT LAKE CITY, UTAH:-45-52 W. 2ND SOUTH ST.
ATLANTA, GA.:- 64-70 MARIETTA ST.
NEW ORLEANS, LA., COR. COMMON & TCHOUPITOULAS STS.
LONDON E.C. ENGLAND-11 QUEEN VICTORIA ST.
COPENHAGEN, DEN.:- FREDERIKSHOLMS KANAL 6
SEATTLE, WASH.:- FIRST & KING STREETS.
CHATTANOOGA, TENN.:-1106-1120 MARKET ST.
INDIANAPOLIS, IND.:-38-42 SO. CAPITOL AVE.
DENVER, COL.:- 1556 WAZEE STREET.
HELENA, MONT.:- 113-117 MAIN ST.
PORTLAND, ORE.:- 69-75 N. 12TH ST.
PHILADELPHIA, PA.:- 19 NORTH SEVENTH ST.

FOREIGN DEPOTS

PARIS FRANCE, 76 AVE. DE LA REPUBLIQUE.
PEERLESS RUBBER SELLING CO. OF AUSTRALASIA, LT'D. 1 ASH STREET, SYDNEY AUSTRALIA.
SYRACUSE, N.Y.-212-214 SO. CLINTON ST.
ROCHESTER, N.Y.-24 EXCHANGE ST.
ST. LOUIS, MO.,-454 PIERCE B'L'D'G.
LOS ANGELES, CAL.:- 359 NORTH MAIN ST.
BUFFALO, N.Y.:- 379-383 WASHINGTON ST.
BOSTON, MASS.:-110 FEDERAL ST.
BALTIMORE, MD.:-37 HOPKINS PLACE
LOUISVILLE, KY., NORTHEAST COR. SECOND & WASHINGTON STS.
VANCOUVER, B.C.-CARRAL & ALEXANDER STS.
JOHANNESBURG, SOUTH AFRICA, BARSDORF B'L'D'G.

# Sturtevant

## The Economical Steam Turbine



¶ **Indestructible Rotor** built of solid forged steel, with buckets milled into the rim.

¶ **Supplementary Buckets** which will effect a great saving in steam.

¶ **Individual Nozzle Valves** for closing some of the nozzles when operating on light load.

¶ **Channel Scoop Oiling Device** supplying positive lubrication where it is most needed.

¶ **Emergency Governor,** separate and positive. The turbine can't run away.

**A NEW TYPE WITH MANY NEW PATENTED FEATURES**

Catalog 190 describes the Turbine. Send for one.

**B. F. STURTEVANT CO. - Hyde Park, Mass.**

**Offices in all Principal Cities**

# S. & K. Automatic Engine Lubricator

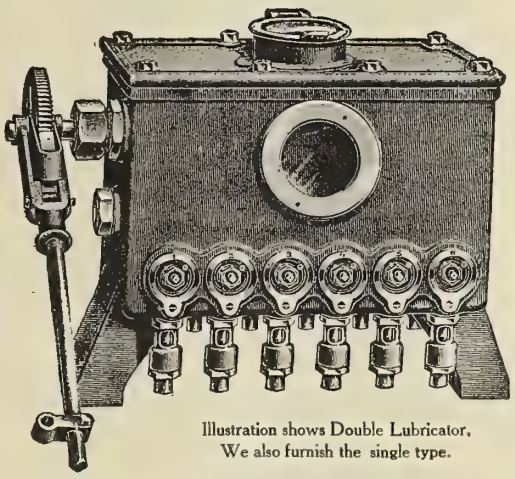
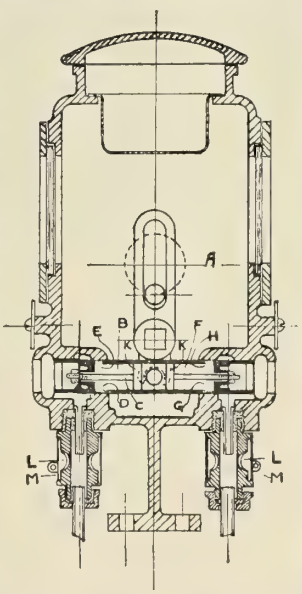


Illustration shows Double Lubricator. We also furnish the single type.

**The North German Lloyd Company has been able to reduce the number of oilers by nine men on one ship, and has found an actual saving of 40% in the oil used. This should be sufficient proof of the absolute reliability and efficiency of the S. & K. Automatic Lubricator.**




**Efficient,** because it supplies enough oil to insure smooth running of every bearing on the engine, the quantity of oil varying with the speed of the engine.

**Economical,** because it does not supply too much oil to any bearing. Lubrication stops when the engine stops. It saves considerable manual labor. It saves the bearings from unnecessary wear due to excessive friction.

**Reliable,** because the moving parts are reduced to a minimum. It is positive in its action, supplying sufficient oil at regular intervals to each bearing. The quantity of oil to any bearing can be increased, reduced, or stopped without interfering with any other bearing. There are no valves to get out of order, and no small holes or wicks to get clogged with dirt. The S. & K. Automatic Lubricator is working successfully on many Atlantic liners.

CATALOG AND PRICES UPON APPLICATION

**SCHUTTE & KÖRTING COMPANY, Philadelphia, Pa.**

# OVER 1000 BLAKE MARINE PUMPS

**Sailed out of New York Harbor, Nov. 2,**

## ON THE ATLANTIC FLEET

Of the 102 warships mobilized for the inspection and review by the President and Secretary of the Navy, 65 are equipped with Blake pumps, and of the remaining 37, nine carry no steam pumps and eight were built abroad.

Pumps that not only meet the Government specifications, but when installed so satisfactorily fulfill the requirements that repeat orders continue to be received, ***must be*** and ***are*** the best pumps for any marine service. Moreover they ***must*** and ***do*** represent the best value at any price, for Uncle Sam is a very careful buyer.

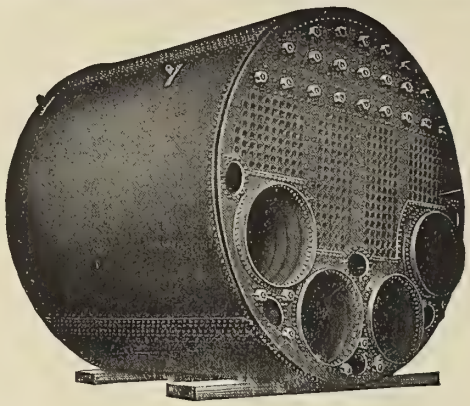
*Send for Catalogue BK 106-43*

**The Blake & Knowles Steam Pump Works**

**Marine Department**

**115 Broadway, New York City**

BK148.2



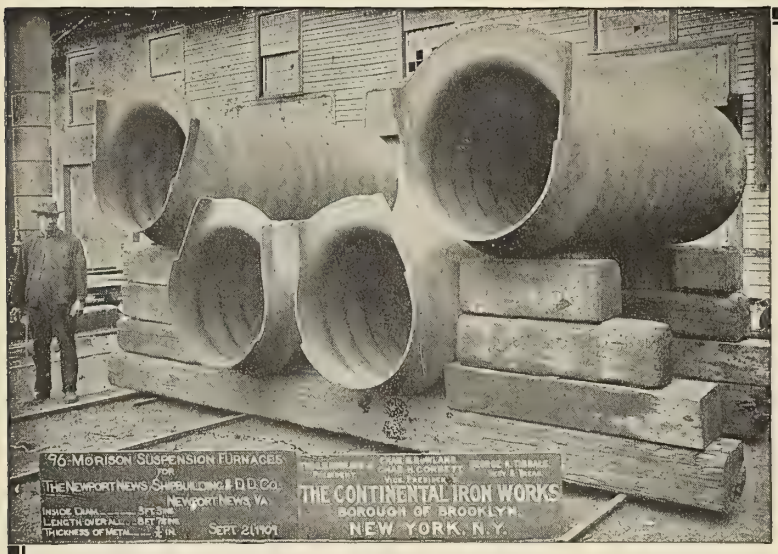
# Marine Boilers

**Of All Types**

**Centrifugal Pumping Machinery**

**KINGSFORD FOUNDRY AND MACHINE WORKS**

**OSWEGO, N. Y.**




# MORISON SUSPENSION FURNACES

## FOR MARINE AND LAND BOILERS

UNIFORM THICKNESS
EASILY CLEANED
UNEXCELLED STRENGTH

MADE TO UNITED STATES,
LLOYDS BUREAU VERITAS
OR ANY OTHER REQUIREMENTS

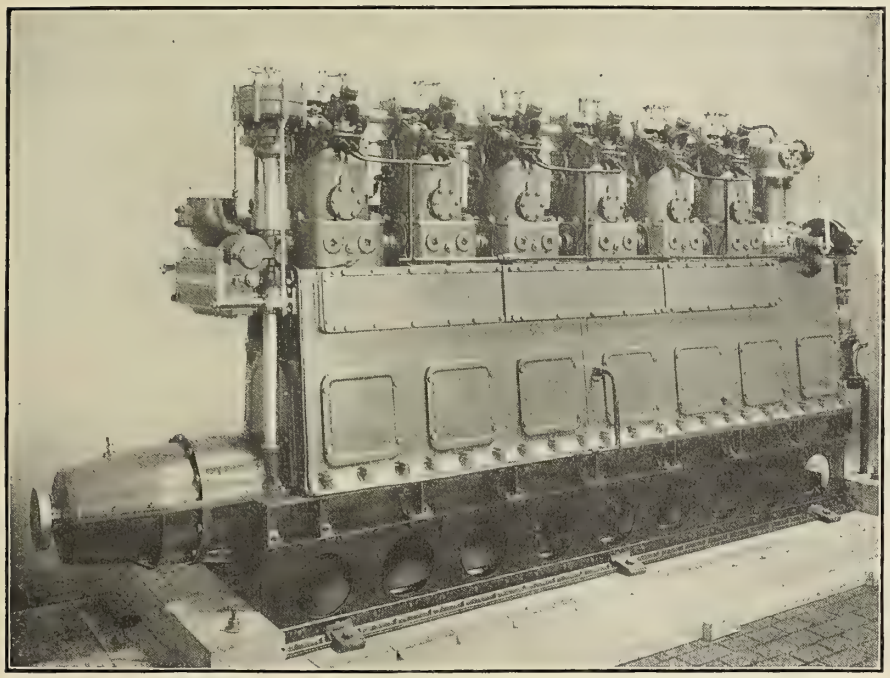
**MADE IN THE UNITED STATES BY**

## THE CONTINENTAL IRON WORKS

**West and Calyer Streets, BOROUGH OF BROOKLYN, NEW YORK**

**Near 10th and 23d Street Ferries**

# THE AMERICAN-NUREMBURG



## *Heavy Oil Marine Engine*

## THE MOST ECONOMICAL MOTIVE POWER

**Adopted by the U.S. Navy and Foreign Navies**

Sold under positive guarantee as regards fuel consumption, which averages less than ***one-half pound*** per H.P. hour. Fuel costs only 2 to 3 cents per gallon.

The ideal motive power for power boats—tug boats—yachts—barges—fishing and sailing vessels—cargo vessels and fast passenger vessels.

Built in units of from 50 H.P. to 2500 H.P. Two types, heavy of about 80 lbs. per H.P.—light of 40 lbs. per H.P. Reversible and self-starting

**Cost of Fuel per 100 H. P. hours**

| | |
|---|---|
| **Gasoline,** | **$1.20** |
| **Steam,** | **$0.40** |
| **Heavy Oil,** | **$0.20** |

**Manufactured by New London Ship & Engine Company, Groton, Conn.**

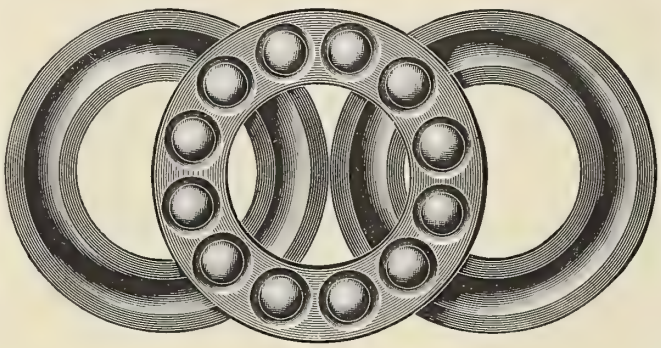


*When writing to advertisers, please mention* INTERNATIONAL MARINE ENGINEERING.

THE ONLY

# Propeller Thrust

FOR HIGH SPEED



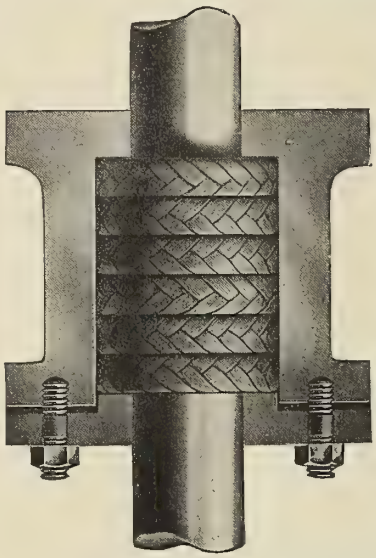
## Bantam Anti-Friction Co.

BANTAM, CONN., U. S. A.

WE MAKE THE BEST



# DUVAL METALLIC PACKING



is a woven packing made of fine white alloy wire accurately plaited in square form. It is especially adapted for superheated steam and high pressure steam and water.

Easily first among packings, as are

FOSTER SUPERHEATERS

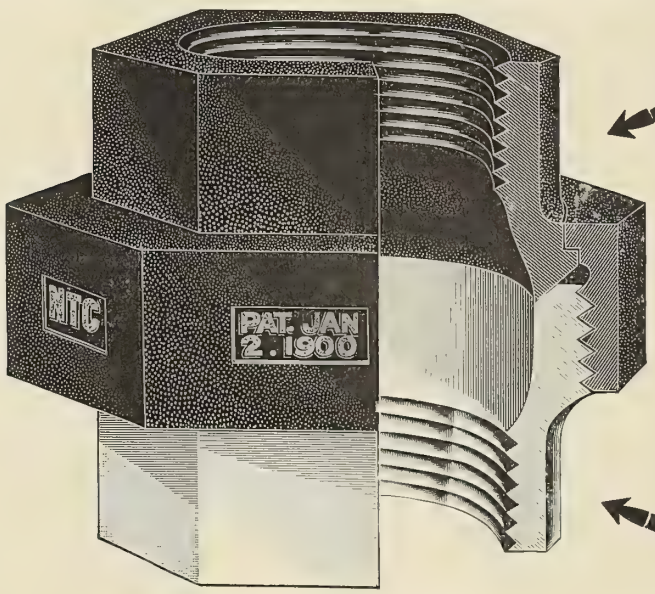
among superheaters.

## POWER SPECIALTY COMPANY

NEW YORK BOSTON

CHICAGO PHILADELPHIA SAN FRANCISCO






"The Union With No Inserted Parts"

# "Kewanee" Unions Replace All Leaky Unions

¶ Prejudice for or against the use of an article of any kind is largely a matter of habit.
¶ Our representatives frequently meet as a kind of argument against trying the "*Kewanee*" *Union*, something like this: "Well, you see we have always used an all brass (or malleable) union," as the case may be, as though that settled it.
¶ Sometimes the coming of a new Foreman, Superintendent or other mechanical man, who has used "*Kewanee*" *Unions* elsewhere, brings in a new point of view.
¶ For example: One of our representatives recently called upon a large manufacturer of Ice Making Machinery, and the Superintendent said:

**"They have always used all brass unions here, but I know what the "Kewanee" Union is, and have recommended that "Kewanee" Unions replace all leaky unions throughout the plant."**

¶ There seemed to have been a goodly number of "leaky unions," for the Superintendent entered a stock order for various sizes and kinds of "*Kewanee*" *Unions*.
¶ The reason why "*Kewanee*" *Unions* are satisfactory is epitomized below:

(a) Brass to iron thread connection—No Corrosion.
(b) Brass to iron ball joint seat—No Gasket.
(c) 125 pounds compressed air test under water—No Defective Fittings.
(d) Solid three-piece construction—No Inserted Parts.
(e) Easily disconnected—No Force Required.

**Our new booklet, "The Whole Kewanee Family" tells all about "Kewanee" Unions. Get a copy to keep on file. It will help you eliminate wastes from leaky unions. A post-card brings it!**

## NATIONAL TUBE COMPANY

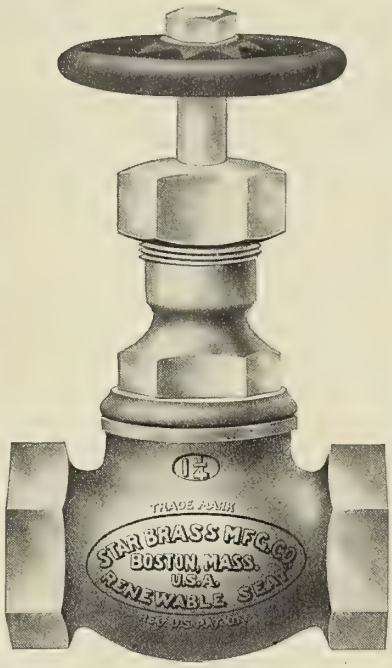
General Sales Offices: Frick Building, Pittsburgh, Pa.

District Sales Offices: Atlanta Chicago Denver New Orleans New York Philadelphia Pittsburgh St. Louis Salt Lake City
Pacific Coast Representatives: U. S. Steel Products Company—San Francisco—Seattle—Portland—Los Angeles
Export Representatives: United States Steel Products Company, New York City

# The "Renewable"

EXTRA HEAVY
## GLOBE

MARINE
## VALVE




The most modern and thoroughly up-to-date globe valve at present on the market. By far the best globe valve for marine service yet produced, it being particularly adapted for high pressures, also for general severe marine work.

**SOME OF OUR SPECIAL FEATURES ARE ENUMERATED BELOW:**

All castings of our special bronze mixture, made from metal patterns on pneumatic molding machines.

All parts made with special tools, insuring absolute uniformity.

Body of special rugged design; steam is not retarded in its flow owing to body's form—it is so designed that metal is distributed where most needed for severe use.

Seat and Disc are both Renewable and extra heavy; the bevel or taper of both is at a sharp angle, with a very light bearing, insuring less liability of foreign matter lodging on seat when valve is closed, also less chance of wire drawing and cutting.

Seat rings are of a "Patented" form with special taper seat where screwed in body. This design insures a perfect joint and absence of liability to distortion from lack of care in installation or unequal expansion in use.

The bonnet is novel in design, having many unique features. First, it is absolutely self-draining, thereby eliminating all liability to freeze when used in cold positions; has extra large and deep packing space, gland and nut. Long thread in body, insuring strength and tightness.

Stems, or spindles are extra heavy, made with large "Acme" quick-opening threads.

Valves can be re-packed under pressure, when wide open, as top of discs seat against bottom of bonnet, making steam tight joint.

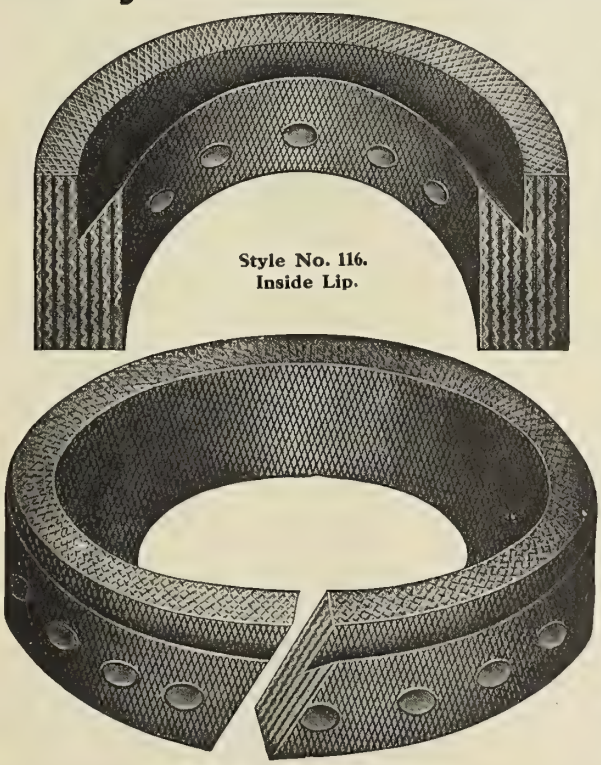
Handwheel is fastened to stem with hexagon nut, and can readily be removed and replaced.

MANUFACTURED BY

**STAR BRASS MFG. CO., 104-114 East Dedham Street, Boston, Mass.**

Branches: NEW YORK CITY, PITTSBURGH, PA.

# Do you have trouble with your Packing?



Style No. 116. Inside Lip.

Style No. 115. Outside Lip.

If so, write our factory explaining conditions and get the opinion of an experienced man who has spent years of study along this particular line of business. **No charge for his service.**

We manufacture the highest grade of packing, and prices are surprisingly low. Send us a trial order and be convinced we can save you money.

## Crandall Packing Company

**Factory and General Offices, PALMYRA, N. Y.**

**BRANCHES**

NEW YORK: 136 Liberty Street
BOSTON: 19 High Street
CHICAGO: 153 W. Lake Street
PITTSBURGH: 7117 Mt. Vernon Street
CLEVELAND: 805 Superior Ave., N.W.
KANSAS CITY: 515 Delaware Street
Branch Factory: BIRMINGHAM, 517 So. 20th Street

# THE BABCOCK & WILCOX CO

NEW YORK AND LONDON

## Forged Steel Water Tube Marine Boilers and Marine Superheaters

STRAIGHT TUBES ACCESSIBLE EXPANDED JOINTS

LEADING WATER TUBE BOILER FOR NAVAL AND MERCHANT MARINE SERVICE

DURABLE ECONOMICAL

WORKS:

BAYONNE, NEW JERSEY, U. S. A. RENFREW, SCOTLAND. PARIS, FRANCE OBERHAUSEN, GERMANY

U. S. S. MAYFLOWER

The Private yacht of the President of the United States, fitted with 3000 H. P. of Mosher Water Tube Boilers

## MOSHER WATER TUBE BOILERS

THE SIMPLEST AND MOST COMPACT BOILER MADE

More than 100,000 Horsepower installed in U. S. Naval Vessels alone

MOSHER WATER TUBE BOILER CO.

30 Church Street, New York

E. P. JAMISON & CO., Pacific Coast Representatives

Seattle Tacoma Spokane Portland

San Francisco Vancouver, B. C.

STEAMER "IROQUOIS" which made the trip from Lake Superior to Puget Sound via Strait of Magellan and reported ready for service, and has continued that service for six years since.

Her sister ship made the same trip about a month later and is still giving good service on the same run.

The Steamship Company owning both of the above boats built another one called the "Kulshan" about a year ago and installed Roberts Boilers which are even a greater success than those in the boats first mentioned.

Ask the man who has used all the other types of Water Tube Boilers, as well as the "Roberts," and be guided by his advice.

He knows.

The man who has only used one type does not know, but may be prejudiced.

If there is no one among your acquaintances who has used more than one type to whom you can apply for advice, write us for a list of customers who have used many makes, including the "Roberts," to whom we will be glad to refer you.

## The Roberts Safety Water Tube Boiler Co.

Telephone 49 112-114 CHESTNUT ST., RED BANK, NEW JERSEY

TRADE PENBERTHY MARK.

AUTOMATIC INJECTOR

THE WORLD'S STANDARD BOILER FEEDER FOR OVER A QUARTER OF A CENTURY

*WRITE FOR CATALOG AND SAMPLE COPY OF OUR 80-PAGE MAGAZINE*

PENBERTHY INJECTOR COMPANY, Detroit, Mich., U. S. A.

**POSITIVE AND RAPID BOILER CIRCULATION**

Maintained by our System in Scotch, Leg and Locomotive Types of Boilers

**ROSS SCHOFIELD COMPANY** — **39 Cortlandt Street, NEW YORK**

**BOSTON ENGINEERING CO.** Boston, Mass. — **E. J. CODD CO.** Baltimore, Md.

**THE CHARLES WARD ENGINEERING WORKS**

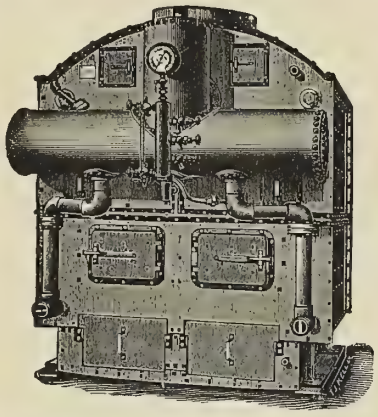
**CHARLESTON, WEST VIRGINIA**

**WATER TUBE BOILERS, MARINE ENGINES**

**LIGHT DRAFT RIVER STEAMERS**

**YACHTS**

**Steel Boats for Export, "Knock-Down" or Sectional**

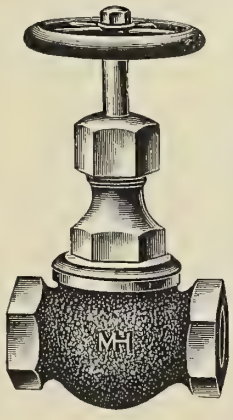


WE BUILD—light—compact—durable—accessible—sectional—**BOILERS**—for all marine purposes. ¶ Our new catalogue describes them, tells who has them, shows cuts of more than 280 vessels we have equipped.

**Let us mail you one**

***ALMY WATER-TUBE BOILER CO.***

***PROVIDENCE, R. I.***



**McNAB & HARLIN MANUFACTURING COMPANY**

WE wish to call the attention of buyers of Valves for Marine Work, to the

**HIGH CLASS JENKINS DISC VALVES**

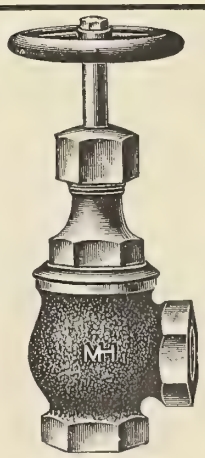
we manufacture. They are second to none on the market to-day. Every valve is thoroughly tested, is made of the best of materials by skilled mechanics with the latest up-to-date machinery.

We carry a large stock of all sizes, **Globe, Angle** and **Check** types, thus enabling us to make prompt shipments of all orders.

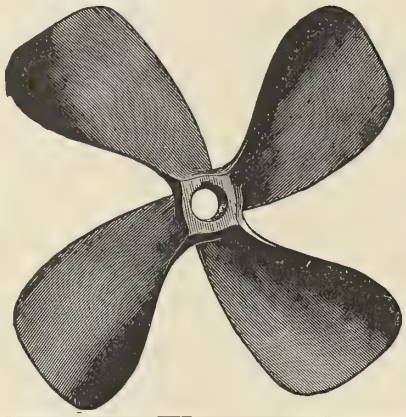
Prices and samples submitted upon request.

**50-56 John Street** :: :: **New York**

**Factory, PATERSON, N. J.**



Over Thirty years' experience building



Engines
and
Propeller
Wheels

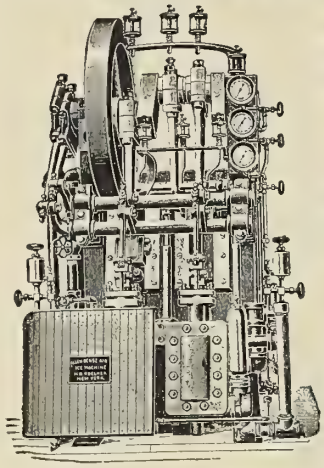
H.G. TROUT CO.
King Iron Works
226 Ohio Street,
BUFFALO, N. Y.

SHERIFFS
MANUFACTURING CO.
ESTABLISHED 1854
Marine Machinery
AND

Over 3,000 Sheriffs' Propeller Wheels, made to date, of the best material and castings, give desired results.

MILWAUKEE, WIS., U. S. A.

The ALLEN DENSE-AIR
ICE MACHINE



contains no chemicals, only air at easy pressure (65 lbs.), in pipes. It is placed in the engine room and attended by the regular engineers, while meat room and ice-making box and galley and pantry refrigerators are at their usual places.

**Steam Yachts**

Electra, Nourmahal, May, Josephine, Virginia, Thespia, Dorothea, Felicia, Aloha, Attaquin, Nydia, Alcedo, Enterprise, Alvena, Margaret, Kenawha, Pantooset, Rheclair, Aztec, Lorena, Constant, Riviera, Czarina, Rambler, Apache, Dreamer, Emrose, Sultana, Visitor II.

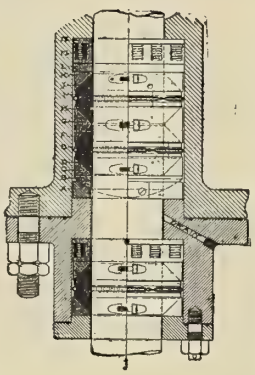
More than 250 are in active service on U. S. and foreign men-of-war, steam yachts and merchant steamers in the tropics.

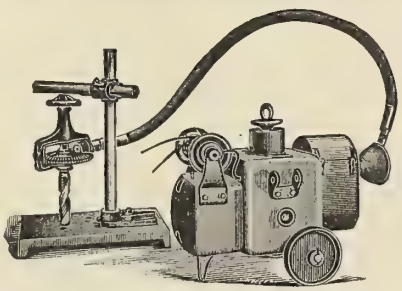
H. B. ROELKER
41 Maiden Lane, New York

KATZENSTEIN'S
Metallic Packings
Of different designs for stuffing boxes of engines, pumps, etc.

Flexible Tubular Metallic Packing for Slip Joints on Steam Pipes . . . . . .

L. KATZENSTEIN & CO.
General Machinists' and Engineers' Supplies . . . .
358 West St., New York, U. S. A.





SELIG SONNENTHAL & CO.
35 Queen Victoria Street
London, Eng.

STOW MFG. CO., BINGHAMTON, N. Y.
Established 1875
INVENTORS AND LARGEST MFRS. IN THE WORLD OF THE
STOW FLEXIBLE SHAFT
FOR ALL PURPOSES

Our Combination of FLEXIBLE SHAFT and MULTI-SPEED ELECTRIC MOTOR is almost indispensable on any vessel having an Electric Current, for portable DRILLING, TAPPING, REAMING, etc. It can be easily transported to any part of the same, and repairs made in a fraction of the time required by hand. Correspondence solicited.

WRITE FOR CATALOGUE AND PRICE LIST

Patent
"Hezzanith" Binoculars.

# HEATH & CO. LTD.,

**CRAYFORD, LONDON.**

ESTABLISHED 1845.

Cables and Telegrams:
POLARIS, LONDON.
HEATH, CRAYFORD.

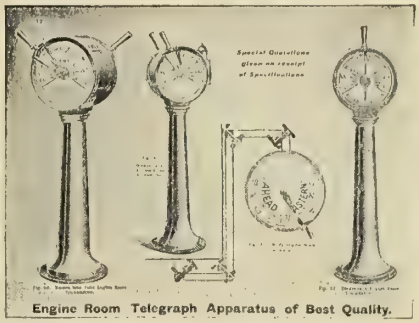
Codes:
ABC 5th Ed.
"Hezzanith."

CATALOGUES FREE ON APPLICATION.

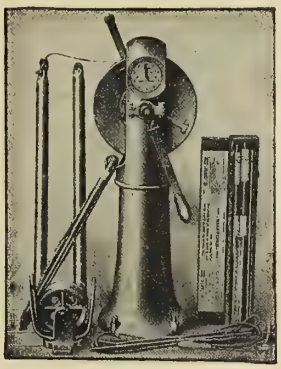
Grand Prix
Naval Exhibition
Bordeaux, 1907.

TRADE MARK:
"HEZZANITH."

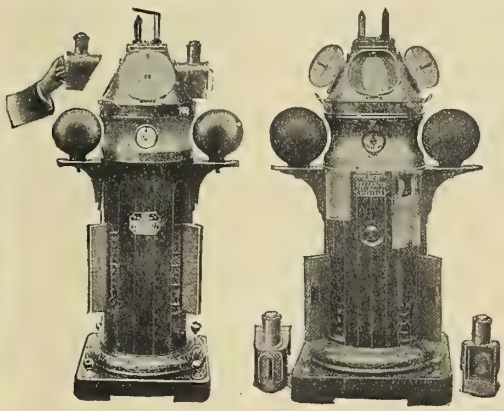
Gold Medal
Naval Exhibition
London, 1905.



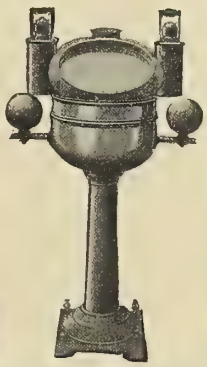

Engine Room
Telegraph Apparatus of Best Quality.



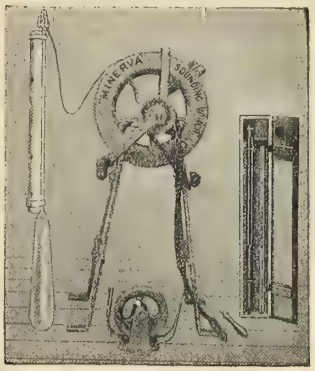
"Hezzanith"
Sounding Machines.



"Hezzanith" Mark I. "Hezzanith" Mark II.
Patent Binnacles and Compasses.



Binnacles & Compasses
of every description.




"Minerva"
Atmospheric Sounding Machine.

**Please specify "HEZZANITH" Instruments in Outfits and Replacements.**

# DREDGING PLANT,

## FLOATING CRANES,

## COAL BUNKERING VESSELS.

*Apply to . . .*

## WERF GUSTO

## FIRMA A. F. SMULDERS,

## SCHIEDAM (HOLLAND.)

*Telegrams:*
*"ASMULDERS, SCHIEDAM."*

**ARTHUR R. BROWN,** 54, NEW BROAD STREET, LONDON, E.C.

**Shipbuilder, Engineer and Contractor.**

***Specialities:***—Passenger and Cargo Steamers for the Amazon and all kinds of Light Draft River Steamers, Tunnel Boats, Sternwheelers, Tugs, Launches, Lighters, Engines and Boilers, also Dredges for Mining and Harbour work.

*A large number of repeat orders received for Passenger Boats for the Amazon, and other places.*

Between **30** and **40** Gold, Tin and Platinum Dredges supplied to all parts of the World. These hold the record for the lowest working cost, greatest number of hours worked, and lowest cost of repairs.

***Repeat orders received from all parts of the World owing to successful working, in spite of a protective duty of 45%.***

**WRITE FOR ILLUSTRATED CATALOGUE.**

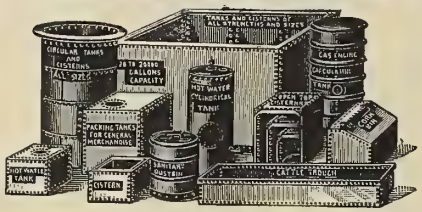
Telephone No.:— 3418 LONDON WALL.

Telegraphic Address:— "EMBEDDED, LONDON."

Codes used:—A B C 5th edition, Liebers, Bedford McNeil.

**TANKS** 20 to 2,000 galls. and up to ⅜ in. thick. **RECTANGULAR & CIRCULAR.**

Gas and Oil Engine Tanks and Ice Tanks a Speciality.



REGISTERED TELEGRAPHIC ADDRESS: "TANKS, SHIPLEY."

TELEPHONE: No. 35.

ESTABLISHED 1884.

Send for Price List and Sample Tank.

**W. P. BUTTERFIELD, LD., SHIPLEY, YORKS, ENG.**

ON THE ADMIRALTY AND WAR OFFICE LISTS.

**NOW READY** **3rd EDITION**

**Re-written, Up-to-date and Enlarged**

**'THE MARINE STEAM TURBINE'**

By J. W. SOTHERN, M.I.E.S.

**Contains comprehensive illustrated descriptions of the Parsons and Curtis type Marine Turbines, together with constructive and general practical data.**

**200 ILLUSTRATIONS** **Price 12/6 net.**

**7th Edition.** NOW ON SALE. **Price 10/6 net.**

**"VERBAL" NOTES & SKETCHES FOR MARINE ENGINEERS.**

**640 Pages.** **515 Illustrations.**

By J. W. SOTHERN, M.I.E.S.

*Author, "Marine Indicator Cards," etc.*

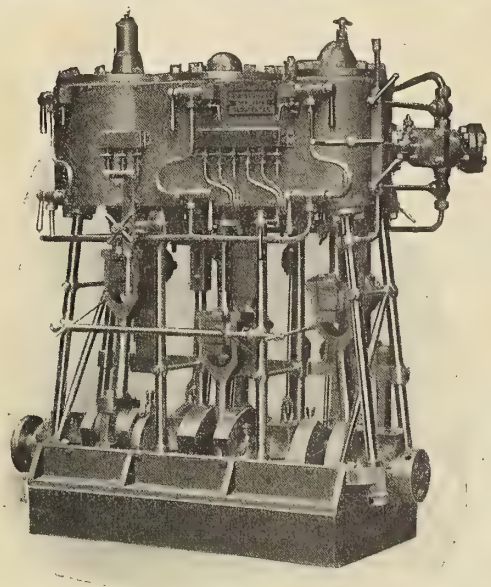
ENLARGED, RE-WRITTEN AND RE-ILLUSTRATED.

Acknowledged to be the most practical book published on Verbal and Elementary Questions; is also invaluable as a general reference work for Marine Engineers of all grades.

**LIGHT FRAMED ENGINES**

FOR

**STEAM YACHTS, LAUNCHES, PINNACES, ETC.**



**W. SISSON & CO. LTD., Engineers,**

**GLOUCESTER, England.**

CABLES- "SISSON, GLOUCESTER, ENGLAND."

**SHIPS' EQUIPMENTS**

= Deck Pillars, =
Boats' Davits, Masts,
Defence Booms, =
Derricks, all in
Weldless Steel
Mannesmann
Tubes, etc.,
etc. = =

**LIGHT, RELIABLE, ECONOMICAL Substitutes for Solid Articles.**

***Highest Awards at Franco-British Exhibition.***

**The British Mannesmann Tube Co. Ltd.**

**SALISBURY HOUSE, LONDON, E.C.**

**Works: LANDORE, R.S.O., SOUTH WALES.**

# INGOT METALS FOR MARINE ENGINEERING

## AND ALL OTHER PURPOSES.

**WE MAKE EVERY** description of INGOT METALS to analysis for Admiralty purposes. Gun Metal, Yellow Metal, Bush Brass, etc.; ordinary INGOT METALS for Engineering Purposes.

**ARE YOU SATISFIED** that you are obtaining the best prices for SCRAP METAL?

## SEND US YOUR ENQUIRIES.

Brass and Copper Ashes; Brass and Copper Scrap; Borings Dust; Sweepings, etc., and every description of Metallic Residues PURCHASED.

## PARK & PATERSON, LTD.

*Chief Office and Works:*

**PARKHEAD, GLASGOW.**

*(Established 1872.)*

Telegrams: "CUPRUM, GLASGOW." | Telephones: 2679 BRIDGETON, GLASGOW. P.O. Y 193 (2 lines).

*Branch Works:*

**VICKERS STREET, MILES PLATTING, MANCHESTER.**

Telegrams: "CUPRUM, MANCHESTER." Telephone: CITY, 3913.

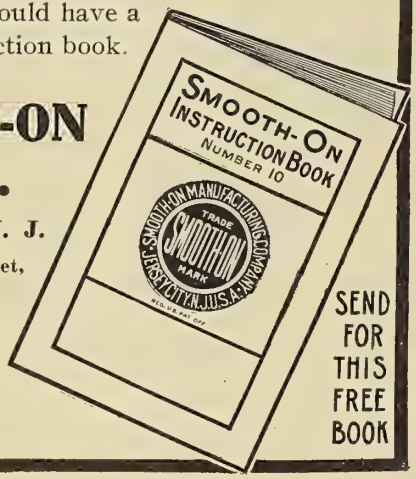
# SMOOTH-ON

## IRON CEMENTS

Positively stop all leaks of steam, water, fire or oil.

They are easy to apply, harden quickly and when hard, expand and contract with the iron.

Every engineer should have a copy of our instruction book.




SEND FOR THIS FREE BOOK

**SMOOTH-ON MFG. CO.**

JERSEY CITY, N. J.

231 N. Jefferson Street, Chicago

94 Market Street, San Francisco

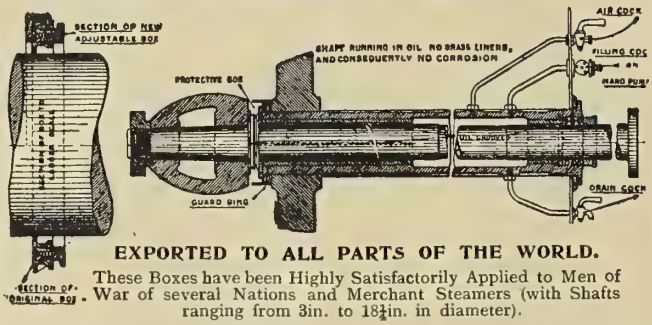
8 White Street, Moorfields, E. C., London



CEDERVALL'S PATENT

# PROTECTIVE LUBRICATING BOXES

***For Propeller Shafts.***




**EXPORTED TO ALL PARTS OF THE WORLD.**

These Boxes have been Highly Satisfactorily Applied to Men of War of several Nations and Merchant Steamers (with Shafts ranging from 3in. to 18½in. in diameter).

Old Stern Tube Arrangements can be altered for application of this Lubricating Box at a very Nominal Cost.

MANUFACTURERS:

## F. R. CEDERVALL & SÖNER,

***GOTHENBURG (Sweden).***

**Agents:—**

*England, East Coast:* Jos. Johnson, Newcastle-on-Tyne. *England, West Coast:* Maxton & Sinclair, Liverpool. *Scotland and Ireland:* John G. Kincaid & Co., Ltd., Greenock. *Bergen:* C. Dahm. *Haugesund:* Fritjof Eides Eftfg. *Stavanger:* D. Balchen.



# ISHERWOOD SYSTEM OF SHIP CONSTRUCTION

**MEANS**

***INCREASED STRENGTH***
***INCREASED CAPACITY FOR BALE GOODS***
***INCREASED D.W. CARRYING CAPACITY***
***IMPROVED VENTILATION***
***REDUCED COST OF MAINTENANCE***
***REDUCED VIBRATION.***

## SUITABLE FOR ALL TYPES OF VESSELS.

**RESULTS TO DATE—**

**124 VESSELS, REPRESENTING ABOUT 511,000 GROSS REGISTER TONS, BUILT OR BUILDING BY 32 SHIPBUILDERS FOR 53 SHIPOWNERS.**

FOR PARTICULARS APPLY TO

Nat. Tel. 661.

## J. W. ISHERWOOD,

Telegraphic Address: "ISHERWOOD," MIDDLESBROUGH.

**ZETLAND BUILDINGS, MIDDLESBROUGH, ENGLAND.**

**Or to S. C. CHAMBERS & CO., 3, King Street, LIVERPOOL, ENG.**

# SMITH'S DOCK CO., LTD.

***Ship and Engine Builders and Ship Repairers,***

**MIDDLESBROUGH, ENGLAND.**

Steel Screw Passenger Steamer for the River Amazon.

**SPECIALISTS** for all classes of **LIGHT DRAUGHT CARGO** and **PASSENGER STEAMERS, COASTERS, BARGES,** and all classes of **FISHING VESSELS,** including **STEAM WHALING VESSELS.**

The most Modern and Up-to-Date Shipbuilding Yard of its kind in the country, capable of constructing Sixty Vessels per annum, including Engines; also **TWO GRAVING DOCKS.**

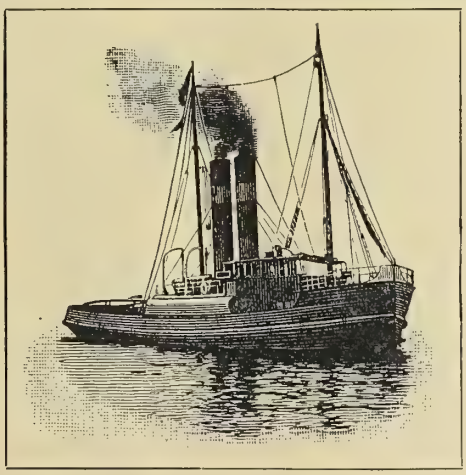
**PROMPT DELIVERY CAN ALWAYS BE GUARANTEED.**

# L. SMIT & Co's.

**SLEEPDIENST, Ltd.**

*(Tug and Salvage Company),*

Telegrams: "LELS." **ROTTERDAM.**



**Towage of Dredgers, Docks, Ships, etc., to any port of the world.**

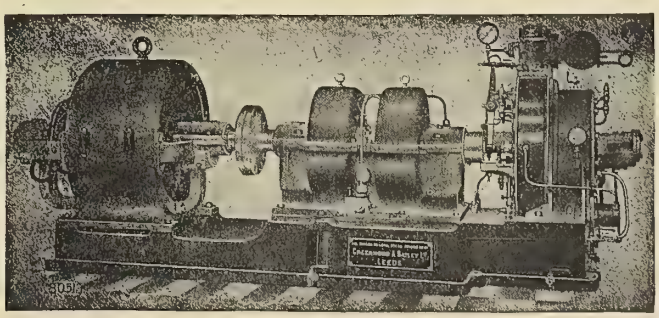
**11 OCEANGOING TUGS RANGING FROM 1,500 TO 400 I.H.P.**

# GREENWOOD & BATLEY, LIMITED,

**LEEDS.**

**Engineers & Machine Tool Makers.**

**De Laval Steam Turbines, Turbine-Dynamos, Turbine-Pumps, and Turbine-Fans.**



**UNEQUALLED FOR SHIP LIGHTING.**

**Compact. Light. Efficient. Reliable.**

*Write for Catalogue—*

No. 13.—General description of De Laval Turbine.
No. 14.—Turbine-Motors.
No. 15.—Turbine-Dynamos and Alternators.

# IMPORTANT ISSUES TO COME

## MARCH NUMBER

This will be our Fifteenth Anniversary Number and will contain valuable articles on "Fifteen Years' Advance in the Design of Marine Machinery," by Dr. W. F. Durand, "Fifteen Years' Advance in Hull Design and Equipment," by Professor C. H. Peabody, and other valuable and timely articles, making this number of great historic importance to everybody interested in engineering in the marine field.

## MAY NUMBER

This will be our Fourth Annual Dredger Number. Our Dredger Numbers have become an important institution, as they contain by all odds the most valuable contributions made during the year to dredging literature.

## JUNE NUMBER

The Twelfth International Congress of Navigation will be held in Philadelphia in June. These Congresses are government affairs and are supported by all the maritime nations of the world. The several important subjects which are up for discussion at this Congress will be fully discussed and illustrated in this number, each by a leading authority.

## NOVEMBER NUMBER

This will be our Third Annual Shallow Draft Boat Number. The fact that copies of this issue are asked for from all parts of the world, even from the waters of Central Africa and the rivers of the interior of South America, as well as from other countries, show the great importance of this issue.

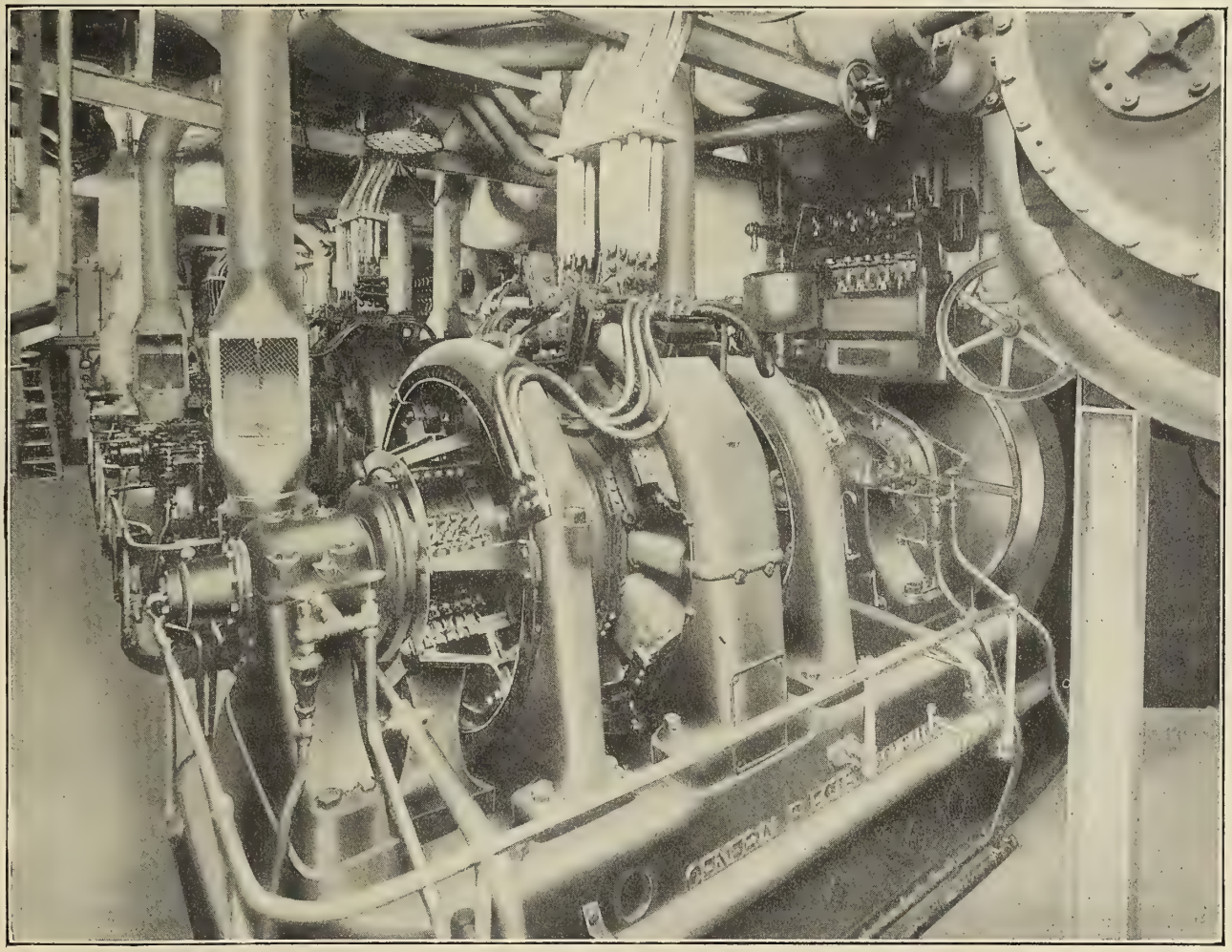
***Advertising Spaces Are Now Being Reserved.***

**INTERNATIONAL MARINE ENGINEERING**

**17 Battery Place, New York** **31 Christopher St., Finsbury Sq., London, E. C.**




*When writing to advertisers, please mention* INTERNATIONAL MARINE ENGINEERING.



Type CC 6-pole, 300 kw. 1500 r.p.m. 125-volt direct current Condensing Turbo Generator Sets, forward dynamo room, U. S. Battleship Utah. Photo by New York Shipbuilding Company.

# Curtis Turbo Generator Sets
## for Marine Service

Four of these 300 kw. turbine sets constitute the standard generating equipment for the modern Battleship.

Every equipment of this size now in use in the U. S. Navy has been furnished by the General Electric Company.

Curtis Turbines are furnished in all sizes for naval or merchant service.

FURTHER INFORMATION ON REQUEST

# General Electric Company

The Largest Electrical Manufacturer in the World

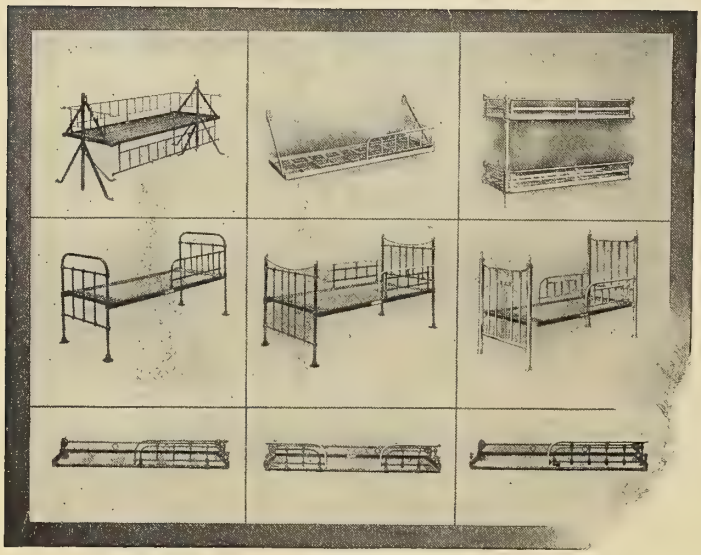
Principal Office: Schenectady, N. Y.

SALES OFFICES IN THE FOLLOWING CITIES:

Baltimore, Md.
Boston, Mass.
Buffalo, N. Y.
Chicago, Ill.
Cleveland, O.
Detroit, Mich. (Office of Selling Agent).
Los Angeles, Cal.
New Haven, Conn.
New Orleans, La.
New York, N. Y.
Philadelphia, Pa.
Portland, Ore.
Richmond, Va.
San Francisco, Cal.
Seattle, Wash.
Mitsui & Co., Tokio, Japan
Bagnall & Hilles, Yokohama, Japan
General Electric Co. (Special Representative), 23 Water St., Yokohama, Japan
General Electric Co. of New York, 83 Cannon St., London, E. C., England

3231

# WHITFIELDS
# BERTHS FOR SHIPS



SWINGING
HANGING
FIXED &
FOLDING

OR ANY OTHER KIND

CATALOGUE AND FULL PARTICULARS POST FREE ON APPLICATION.

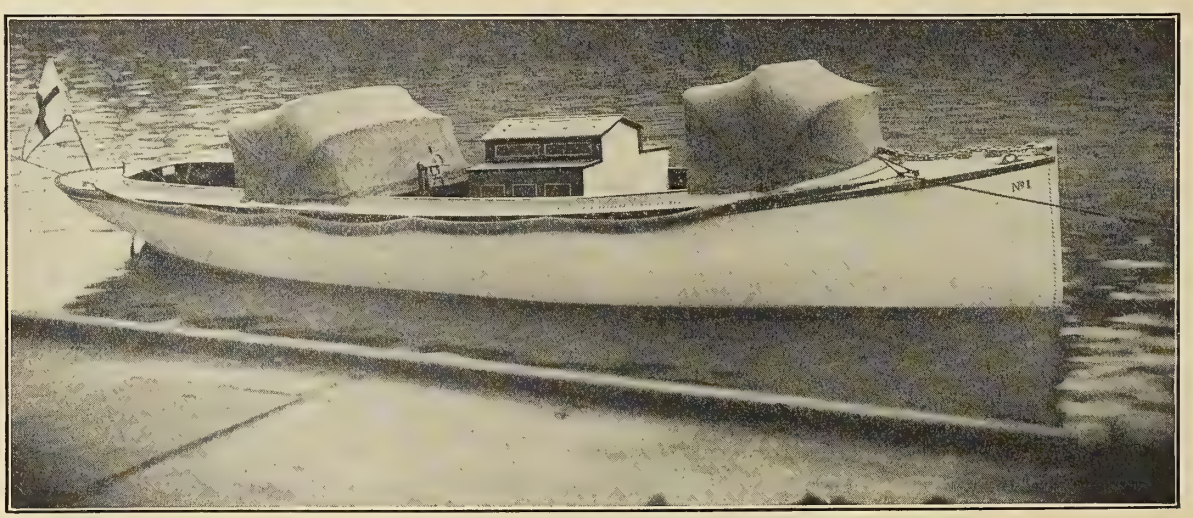
**WHITFIELDS BEDSTEADS LTD.**

(Established 1849, over 60 years ago.)

WATERY LANE,
BORDESLEY,
BIRMINGHAM.

London Address - 10 DANE ST., HIGH HOLBORN.
Glasgow Address - 58 WEST CAMPBELL ST.

# THE SEAMLESS STEEL BOAT CO. LTD.
## WAKEFIELD.



Seamless Steel Motor Launch. 34 ft. 6 in. O.A. × 8 ft. × 3 ft. 9 in. Fitted with 15 H.P. Paraffin Motor.
(As supplied to The Orient Steam Navigation Co. Ltd.)

**A SPECIALITY MADE OF SHALLOW-DRAUGHT CARGO AND PASSENGER LAUNCHES.**

SOLE MAKERS OF:—

**SEAMLESS STEEL** { LAUNCHES, LIFEBOATS, and LIGHTERS.

# Motor Boats

**By Dr. W. F. DURAND**

THIS is the only book which covers the subject of motor boats from a scientific and engineering point of view. It is written in such simple language that any man who knows anything about motor boats can understand every word of it.

It deals with the following subjects:

General Problem of the Motor Boat
The Internal Combustion Engine. General Principles
The Internal Combustion Engine. Application to Marine Service
Carburetion and Ignition
The Boat—Form Below Water and Above
The Design of Form
Practical Boat Construction
Laying Down and Assembling
Power and Speed
Propeller Design
Endurance and Radius of Action
Troubles, and How to Locate Them
Racing Rules and Time Allowance

APPENDIX

Use of Alcohol as Fuel for Gas Engines
Kerosene Engines as Developed Up to Date

*210 Pages, 6 x 8½ Inches Price, $1 50. 6/3*

**International Marine Engineering**

Christopher St., Finsbury Sq. LONDON, E. C.
Whitehall Bldg, 17 Battery Pl. NEW YORK CITY

# Announcement

The new BUFFALO BOOK is now on the press.

It contains something of interest to YOU.

Write for it at once, otherwise you may neglect it.

We want you to have this book because it will make you long to be a BUFFALO owner.

You need it even though you have no immediate intention of buying an engine.

It tells all about the new models, and the refinements of design which mark the 1912 BUFFALOS.

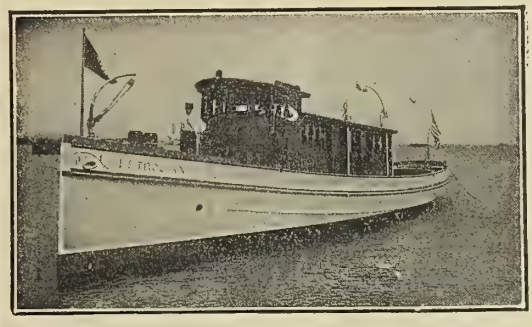
It tells the whole story of the most efficient engines on earth.

"The Engine of Constant Service"

**BUFFALO GASOLENE MOTOR CO.**

**1209-21 Niagara St. - - Buffalo, N. Y.**

# "STANDARD" MOTORS



Tug Petrolia No. 3. Owned by Standard Oil Co. Equipped with 75 H. P. Standard Motor.

**For Commercial Service**

Are now being used in Coastwise Schooners, Fishing Schooners, Tow Boats, Oyster Dredge Boats, Freight and Passenger Service.

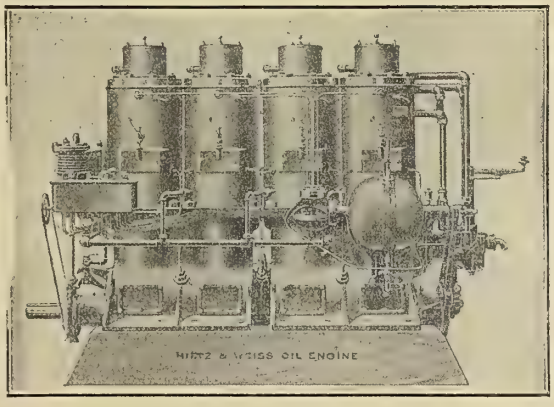
Built in sizes from 12 to 2,000 H. P.

We invite correspondence as to your requirements; are always pleased to submit estimates, etc.

WRITE FOR CATALOGUE

**THE STANDARD MOTOR CONSTRUCTION CO.**

**No. 180 WHITON ST., JERSEY CITY, N. J., U. S. A.**




**MIETZ & WEISS**

# MARINE OIL ENGINES

**2 to 600 H. P.**

Simplest, Safest and Most Reliable and Economical Marine Engines on the Market

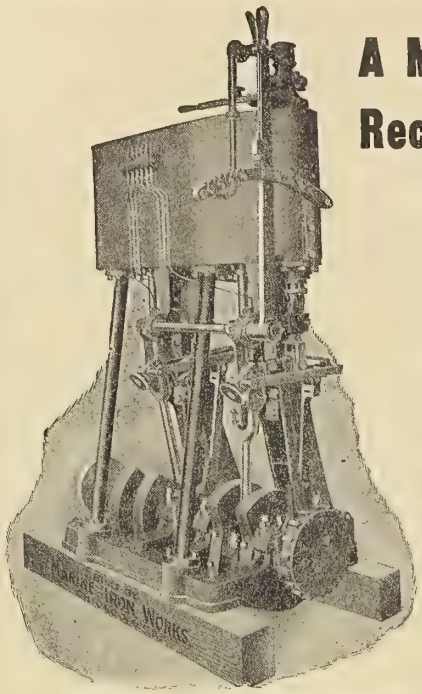
**Use Kerosene, Fuel Oil, Crude Oil and Alcohol**

150,000 H.P. IN OPERATION

**OIL ENGINES FOR STATIONARY POWER PURPOSES**

*SEND FOR CATALOGUE*

**A. MIETZ, 130 Mott Street, New York**



## A Marine Record Breaker

Four years' hard work with total repair bills less than

**25 cents**

We are building and can build for you Engines duplicating this performance.

When in need of Marine Machinery built right for economy and power, write—

**MARINE IRON WORKS**
**2036 Dominick St.**
**CHICAGO**
**Marine Machinery Specialists**

## The Parsons Marine Steam Turbine Co., Ltd.

97 CEDAR STREET, NEW YORK

***Built and Under Construction for Warships of U. S. Navy***
***TOTAL HORSEPOWER, 370,000***

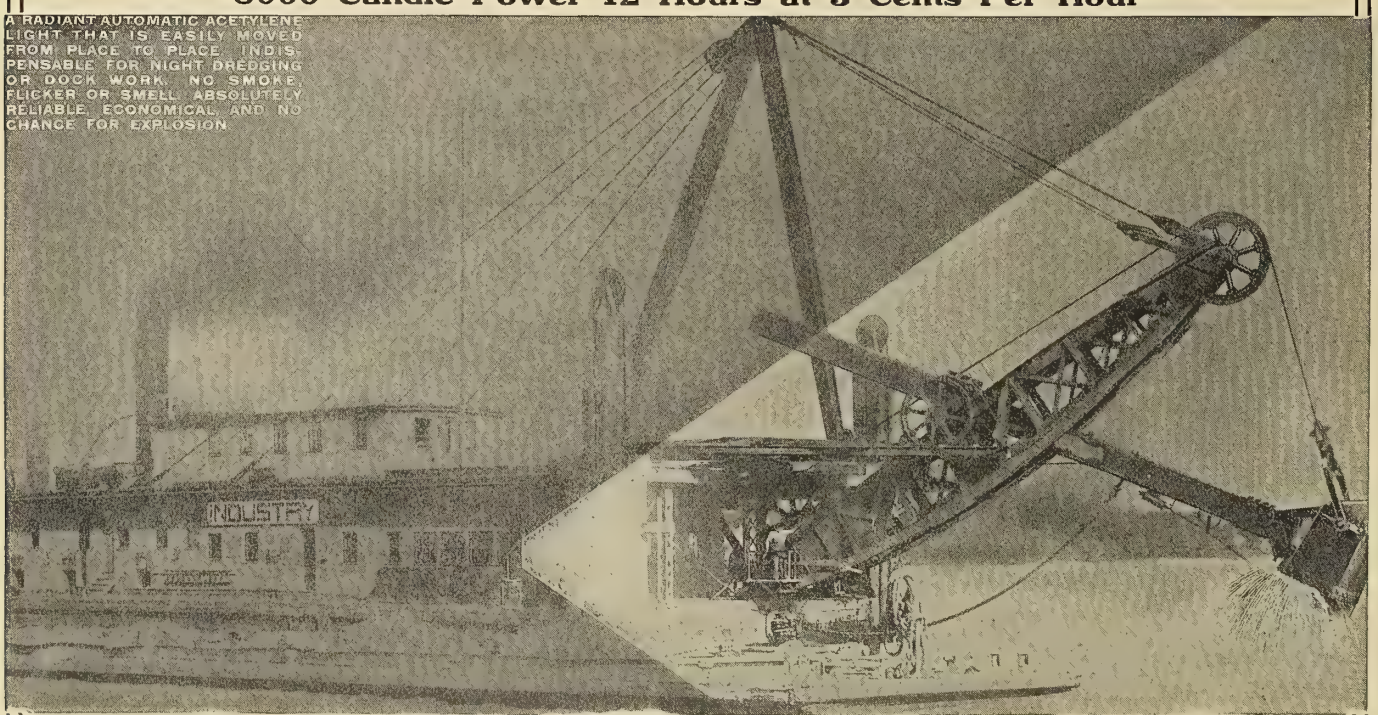
# PATENT

***That Invention***

For information how to do it inquire of Delbert H. Decker, 900 F St., Washington, D. C. 24 years' experience in Patent and Trade Maker Matters.

## THE WILLSON FLARE LIGHT

**8000 Candle Power 12 Hours at 5 Cents Per Hour**

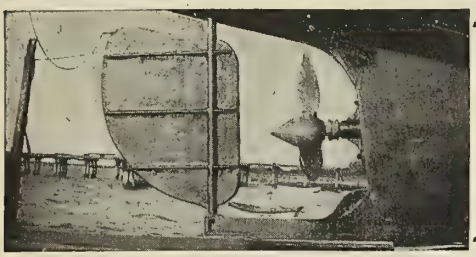

A RADIANT AUTOMATIC ACETYLENE LIGHT THAT IS EASILY MOVED FROM PLACE TO PLACE. INDISPENSABLE FOR NIGHT DREDGING OR DOCK WORK. NO SMOKE, FLICKER OR SMELL. ABSOLUTELY RELIABLE, ECONOMICAL AND NO CHANCE FOR EXPLOSION

**UNITED STATES MARINE SIGNAL COMPANY**
**JOHN J. McGANN, Manager** **170 BROADWAY, NEW YORK**
**WRITE FOR PRICES**

**THE BRIDGEPORT**

"A MOTOR THAT MOTES"
BRIDGEPORT MOTOR COMPANY
Send for "Motor Facts." BRIDGEPORT, CONN., U. S. A.

WE SELL ALL BOOKS ON MARINE ENGINEERING NOT OUT OF PRINT
INTERNATIONAL MARINE ENGINEERING
London: Christopher Street, Finsbury Square, E. C. New York: Whitehall Building, 17 Battery Place



**The Propeller** is the Most Important Part of Your Boat
THE BEST IS NONE TOO GOOD
ADJUSTABLE PITCH and REMOVABLE BLADE PROPELLERS
WILLIAM T. DONNELLY, 17 Battery Place, New York
WRITE FOR CATALOGUE

**Only Dry Dock on Atlantic Coast**
SOUTH OF NEWPORT NEWS
4500 TONS LIFTING CAPACITY
Two Marine Railways—One 1200 Tons, One 500 Tons
All kinds of Repairs done with despatch Constant working force of 300 men
**MERRILL-STEVENS COMPANY, Jacksonville, Fla.**

***Newport News Shipbuilding & Dry Dock Co.***
***WORKS AT NEWPORT NEWS, VA.*** *(On Hampton Roads)*

Equipped with three large Basin Dry Docks of the following dimensions:

| | No. 1 | No. 2 | No. 3 |
|---|---|---|---|
| Length on Top | 610 feet. | 827 feet. | 558 feet. |
| Width on Top | 130 " | 162 " | 147 " |
| Width on Bottom | 50 " | 80 " | 62 " |
| Draught of Water over Sill | 25 " | 30 " | 24 " |

SHOPS are equipped with modern machinery capable of doing the largest work required in ship construction. Tools driven by electricity and compressed air used in constructing and repairing vessels. For estimates and further particulars address
W. A. POST, President, 30 Church St., New York

**BALDT STOCKLESS ANCHOR**

Made of the finest quality of open hearth steel, better than forgings.

Used extensively by the United States Navy on their battleships and cruisers.

*Send for Catalogue*

**BALDT ANCHOR CO.,** CHESTER, PA.

**FORE RIVER SHIPBUILDING CO.**
Established 1884. Incorporated 1904.
Shipbuilders and Engineers
War and Merchant Vessels
Curtis Marine Turbines
Holland Submarine Boats
Office and Works: QUINCY, MASS., U.S.A.

**TIETJEN & LANG DRY DOCK CO.**
HOBOKEN, N. J.
Nine Dry Docks: 600, 800, 1,000, 1,200, 1,400, 1,800, 2,000, 6,000, 10,000 Tons
General Repairs on Wooden and Iron Vessels
17th STREET & PARK AVENUE
Telephone 700 Hoboken HOBOKEN, N. J.

# BATH IRON WORKS

LIMITED

**BATH, MAINE**

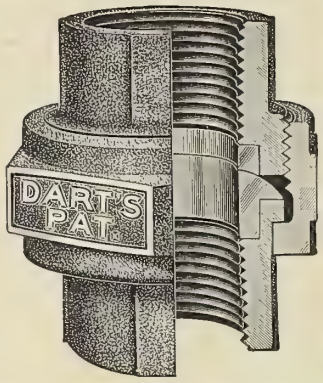
## Shipbuilders and Engineers

**LICENSEE FOR**

**Parsons Marine Turbines**

**Normand Express Water Tube Boilers**

Particular attention given to high speed requirements
Estimates furnished




The Bronze Spherical Seats in combination with Malleable Pipe Ends give the

**DART**

**PATENT UNION**

a distinctive feature which has been unequalled. It is the acknowledged leader.

**E. M. DART MFG. CO.**
**Providence, R. I.**

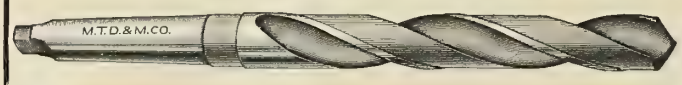
CANADIAN FACTORY
**DART UNION CO., Ltd.**
**Toronto**

TURBINE STEAMSHIPS YALE AND HARVARD

## W. & A. FLETCHER CO.

**PARSON'S MARINE TURBINES**
Marine Engines, Boilers and Machinery of all Kinds
Contractors for Vessels Complete. **HOBOKEN, N. J.**

# "Morse"




## Twist Drills and Tools

Marine Engines require high class tools in their construction. "Morse" Tools are in every way adequate.

**Morse Twist Drill and Machine Co.**
NEW BEDFORD, MASS.

# NOW READY

## MARINE ENGINE DESIGN

**Including the Design of Turning and Reversing Engines**

**By E. M. BRAGG**

*Assistant Professor of Marine Engineering and Naval Architecture, University of Michigan*

**CONTENTS**

The Heat Engine. Calculations for Cylinder Diameters and Stroke. Strength of Materials and Factors of Safety. Cylinders. Pistons. Cylinder Covers. Calculations for Cylinders and Pistons. Maximum Load on Reciprocating Parts. Piston Rods. Allowable Pressure on Bearing Surfaces. Crosshead Blocks. Slipper. Calculations for Piston Rod, Crossman and Slipper. Connecting Rod. Crank Shaft Formula. Lloyds' Rules for Shafting. Bureau Veritas Rules for Shafting. American Bureau of Shipping Rules for Shafting. Crank Shaft Proportions. Maximum Loads on Main Bearing. Engine Bed. Main Bearing Caps. Engine Frame. Calculations for Crank Shaft and Main Bearings. Steam Speeds and Valve Diagrams. Location of Center Links of Cylinders. Calculations for Steam Speeds, Valves, Receiver Pipes and Distance between Cylinder Centers. Piston Valve, Slide Valves and Valve Gear. Calculations for Drag Rods, Eccentric Rods, Links, Eccentrics, Eccentric Straps and Reverse Shafts. Turning Engine Design. Reversing Engine Design.

**175 Pages. 4¼ x 8. Illustrated. Cloth, NET, $2.00**

## Cold Storage, Heating and Ventilating on Board Ship

**By S. F. WALKER**

**CONTENTS**

COLD STORAGE. The Cold Storage Problem. Methods of Cooling the Cold Chambers. Methods of Cooling the Air. Leading the Cooled Air into the Cold Chambers. How the Low Temperature of the Brine or Refrigerant is Produced. The Condenser. Lubrication and Stuffing Boxes of Compressors. Absorption Machines. Circulating Pumps. How Refrigerating Apparatus is Measured. Power Required for Refrigerating Apparatus. Cooling Water. Form of Apparatus for Use on Board Ship. Other Applications of Refrigeration on Board Ship. Cooling Magazines and Officers' and Mens' Quarters. Faults. HEATING. Special Requirements on Board Ship. Difficulties. Methods of Heating Available. Hot Water, Steam, Air, Combined Air and Steam Radiator. The Thermotank System. The System Applied to the S.S. Lusitania. Heating by Electricity. Regulating Heat Delivered by Electric Heaters. VENTILATING. Ventilation by Heating and Cooling. Ventilation of Laboratories and Cattle Spaces. Fans. Size and Power Required. Testing Air Current. Estimating Heat Required. Apparatus Estimated to be Required for Heating the Different Saloons, State Cabins, etc. Cost of Furnishing Heat Required.

**275 Pages. 5½ x 8. Illustrated. Cloth, NET, $2.00**

## D. VAN NOSTRAND COMPANY, Publishers and Booksellers

**23 MURRAY and 27 WARREN STREETS - - NEW YORK**

# "Thick Heads"

**Williams "Heavy Wrenches"—Special Design**

## For Engine Room Troubles

**—and you all have 'em!**

When the "Heavy Wrenches" (Thick Heads) were designed, tool torture was Williams' top thought. Result: Extra leverage, larger contact faces, greater head-thickness-at-weakest-point have been provided for, and you get crow-bar service in an otherwise well-balanced tool.

The "much-in-one" design may be had in Square and Hex Cap Screw and Square and Hex Nut sizes.

At your service now.

# "Big Six"

The abundant usefulness of the "Big Six" Set doesn't impress until you are told of their extraordinary capacity. Seven most important Bolt sizes (¼ to ¾ inch) and Eight most important Cap Screw sizes (¼ to 1 inch) in six wrenches.

The handy canvas carrier-roll does the rest. For sale by dealers. Pocket-size Catalogue of wrench subjects free—should be in every Engine Room.

**J. H. WILLIAMS & CO.**

**Superior Drop-Forgings**

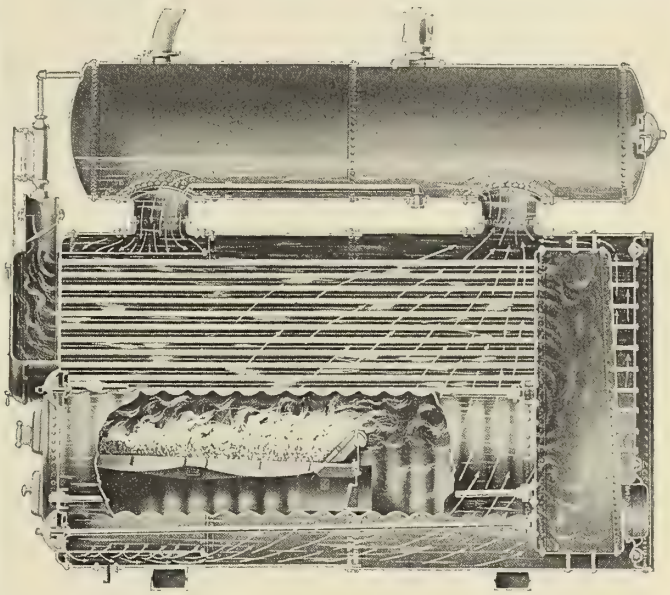
**No. 63 Richards Street**

**Brooklyn, N. Y.**



# *Positive, Rapid Circulation in a Marine Boiler*

## Without Pump or Other Devices



# ROBB-BRADY SCOTCH BOILERS

change the sluggish flow of water into rapid circulation by means of a steam drum and circulating passage under the front neck.

Cost is reduced by using two small shells instead of one large one, and by eliminating the flat top combustion chamber and other expensive staying.

MADE IN THE MOST MODERN AND MOST THOROUGHLY EQUIPPED BOILER SHOP IN THE WORLD.

***Ask for Bulletin No. 3.***

**ROBB ENGINEERING CO., Ltd.**

**So. Framingham, Mass., U. S. A.**

Robb Engineering Co., Ltd., 131 State Street, Boston
S. A. Tolman, Robb Engineering Co., Ltd., 90 West Street, New York
Geo. H. Conner, Robb Engineering Co., Ltd., 49 North 7th St., Philadelphia
Robt. B. Orr Engineering Co., 1205 Commerce Bldg., Kansas City, Mo.
Walter R. Robb, 2405 Telegraph Avenue, Berkeley, Cal.

CANADIAN WORKS, AMHERST, N. S. 39-1

THE ONLY

# Standard American Classification of Shipping

Has authorized agents in all Principal Ports of the world to protect the interests of its patrons. Vessels built under its rules or holding certificates of class or seaworthiness in this Record of Shipping will, with their cargoes, insure at the lowest rates.

RECORD OF AMERICAN AND FOREIGN SHIPPING · ESTABLISHED 1867 · AMERICAN BUREAU OF SHIPPING, NEW YORK · PUBLISHED BY

A. A. RAVEN, President — D. B. DEARBORN, Vice-President
WM. H. H. MOORE, Treasurer — W. S. NICHOLS, Secretary
JOSEPH E. BORDEN, Chief Surveyor

OFFICE

66-68 Beaver Street New York

# OILDAG

**Will Do This:**

Reduce Friction Prevent Wear Save Oil

**Make any good lubricating oil worth three times its original value**

It is the only oil lubricant that contains Deflocculated Graphite, and is put up in condensed form for charging 1, 5, 10 or 50 gallons of oil.

Send $1 and we will send you enough Oildag, prepaid, to charge five (5) gallons of oil. Ask for Booklet F-458.

ACHESON TRADE ELECTRIC FURNACE MARK GRAPHITE

INTERNATIONAL ACHESON GRAPHITE CO.
NIAGARA FALLS, N. Y

General Agents for Oildag and Aquadag, made by Acheson Oildag Co.

SAVE 85 PER CENT
OF YOUR
HAWSER BILL

# "PROVIDENCE"
## STEAM TOWING MACHINE

enables you to make this saving by using steel instead of manila.

WILLIAMSON BROS. CO.,
AMERICAN SHIP WINDLASS CO.
Succeeded by AMERICAN ENGINEERING COMPANY
Philadelphia, Pa. 15-303

# Detail Drawings

of a

## Four Furnace Single End Scotch Boiler

together with

## Diagrammatic Pipe and Auxiliary Plan

used in connection with a

## 1250 H.P. TRIPLE EXPANSION ENGINE

WITH KEY

Naming and Describing Every Part of the Engine.

***Price, $1.00 Postpaid***

INTERNATIONAL MARINE ENGINEERING
17 Battery Place, NEW YORK CITY
31 Christopher Street, Finsbury Square, London, E. C.

IN THE BUSINESS CENTER

# It Will Pay You to be Represented

. . . The Exhibition Department of the BOURSE presents an opportunity to Marine Engine and Boat Builders to maintain a permanent exhibit in the business center of the city, where they will come in contact with Buyers from all over the country. Address . . .

THE BOURSE, Phila.

# *Third Edition*

## *of*

# PRACTICAL MARINE ENGINEERING

**Contains additional chapters on**

**Oil Fuel**
**Steam Turbines**
**Internal Combustion Engines**
**Marine Producer Gas Plants**

**This book is written for**

## MARINE ENGINEERS AND STUDENTS

IT is devoted exclusively to the practical side of Marine Engineering and is especially intended for engineers and students, and for those who are preparing for examinations for Marine Engineers' licenses for all grades.

**PART I.**—Covers the practical side of the subject, giving a great deal of detail regarding marine engines and all that appertains to them, together with much information regarding auxiliaries.

**PART II.**—Covers the general subject of calculations for marine engineers, and furnishes assistance in mathematics to those who may require such aid.

**PART III.**—Covers the latest and best practice in Internal Combustion Engines, Steam Turbines, Oil Fuel and Marine Producer Gas Plants.

The book is illustrated with nearly ***four hundred and fifty diagrams and cuts*** made especially for the purpose, and showing the most approved practice in the different branches of the subject. The text is in such plain, simple language that any man with an ordinary education can easily understand it.

**PRICE, $5.00 (21/-)**

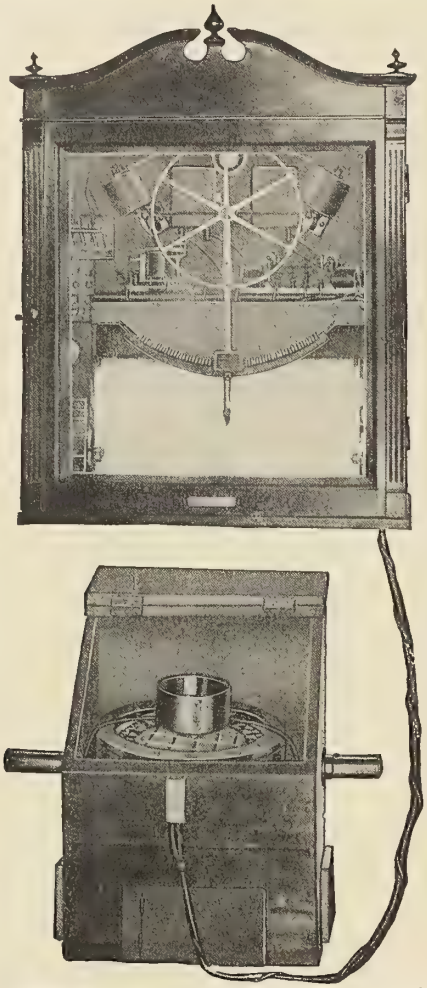
FOR SALE BY

## INTERNATIONAL MARINE ENGINEERING

**17 Battery Place New York** **31 Christopher St., Finsbury Square, E. C., London**




*When writing to advertisers, please mention* INTERNATIONAL MARINE ENGINEERING.



# A PERFECT LOG

The Schuette Recording Compass will keep an accurate automatic record of how your ship is steering.

It will show what course you were steering and the exact time when the course was changed.

*Write for descriptive booklet.*

## SCHUETTE RECORDING COMPASS CO.
### MANITOWOC, WIS., U. S. A.

**HEATH & CO., Ltd.;** Nautical Instrument Manufacturers, **Crayford, London.** Sole Agents for Great Britain. Complete instrument in stock. London showrooms: 2 Tower Royal, Cannon Street, London, E. C.

**WM. ROWEKAMP,** Engineer, Agent, **Lappenbergsallee 4, Hamburg, Germany.** Complete instrument in stock.

**TAKATA & CO.,** Agents, **Tokio, Japan.** Complete Instrument in stock.

**JOHN BLISS & CO.,** Eastern Agents, Nautical Instruments, **128 Front Street, New York.** Complete instrument in stock.

**GEORGE E. BUTLER,** Western Agent, Nautical Instruments and Watch Maker, **Alaska Commercial Bldg., San Francisco.** Complete instrument in stock.



# MARINE ENGINE DESIGN

## Including the Design of Turning and Reversing Engines

### By E. M. BRAGG

**Assistant Professor of Marine Engineering and Naval Architecture, University of Michigan**

CONTENTS

The Heat Engine. Calculations for Cylinder Diameters and Stroke. Strength of Materials and Factors of Safety. Cylinders. Pistons. Cylinder Covers. Calculations for Cylinders and Pistons. Maximum Load on Reciprocating Parts. Piston Rods. Allowable Pressure on Bearing Surfaces. Crosshead Blocks. Slipper. Calculations for Piston Rod, Crossman and Slipper. Connecting Rod. Crank Shaft Formula. Lloyds' Rules for Shafting. Bureau Veritas Rules for Shafting. American Bureau of Shipping Rules for Shafting. Crank Shaft Proportions. Maximum Loads on Main Bearing. Engine Bed. Main Bearing Caps. Engine Frame. Calculations for Crank Shaft and Main Bearings. Steam Speeds and Valve Diagrams. Location of Center Links of Cylinders. Calculations for Steam Speeds, Valves, Receiver Pipes and Distance between Cylinder Centers. Piston Valve, Slide Valves and Valve Gear. Calculations for Drag Rods, Eccentric Rods, Links, Eccentrics, Eccentric Straps and Reverse Shafts. Turning Engine Design. Reversing Engine Design.

**175 Pages. 4¼ x 7½. Illustrated. Cloth, NET, $2.00**

FOR SALE BY

## International Marine Engineering

**Whitehall Bldg., 17 Battery Pl.** NEW YORK CITY

**Christopher St., Finsbury Sq.** LONDON, E. C.

This will identify our representative

Mr. H. N. DINSMORE

who is authorized to take subscriptions in any part of the United States and Canada, to collect the money due for new subscriptions and renewals, and to receipt for same in our name. His mail should be sent to 37 West Tremlett Street, Boston, Mass.

International Marine Engineering
17 BATTERY PLACE, NEW YORK

# 23 Million Pounds

**is the Modulus of Elasticity of**

# MONEL METAL PROPELLERS

and one important reason why a contract for over a fifth of a million pounds of Monel Metal has just been filled for the Argentine Republic, while the United States Navy uses thousands and thousands of pounds of this metal that has the strength of steel and glistens like silver.

The Modulus of Elasticity is a significant feature in propeller work as all metals distort under high stresses within the elastic limit and recover again on removal of stresses. Manganese bronze has a modulus of elasticity of only 13,000,000 lbs., steel, 28,000,000 to 30,000,000 lbs., thus Monel Metal has better physical properties and is less corrodible than manganese bronze with a modulus of elasticity approaching steel that *is* corrodible. Quotations on any size up to 27,000 lbs. weight in one piece. Monel Metal is also made in the form of forgings, sheets, bars, wire, etc., and adapted for scores of uses on shipboard.

**50 Church Street** **RUGGLES-COLES ENGINEERING CO.** **New York City**

**General Agents for The Bayonne Casting Co.**

Chicago Office, McCormick Building 37A—9

## BUYERS' DIRECTORY

ACCESSORIES, BOAT—See BOAT ACCESSORIES.

ACCUMULATORS, HYDRAULIC.
Niles-Bement-Pond Co., New York.

AIR AND CIRCULATING PUMPS (Combined).
Davidson, M. T., Co., New York.
Wheeler Condenser and Engineering Co., Carteret, N. J.

AIR COMPRESSORS.
Independent Pneumatic Tool Co., Chicago and New York.
Norwalk Iron Works, South Norwalk, Conn.

AIR COOLERS.
Power Specialty Co., New York.
Schutte & Körting Co., Philadelphia, Pa.

AIR COUPLINGS.
Independent Pneumatic Tool Co., Chicago and New York.
National Tube Co., Pittsburg, Pa.

AIR DRILLS.
Independent Pneumatic Tool Co., Chicago and New York.
Norwalk Iron Works, South Norwalk, Conn.
Wheeler Condenser and Engineering Co., Carteret, N. J.

AIR HAMMERS—See PNEUMATIC TOOLS.

AIR HOISTS.
Independent Pneumatic Tool Co., Chicago and New York.

AIR HOSE.
Independent Pneumatic Tool Co., Chicago and New York.

AIR MOTORS.
Independent Pneumatic Tool Co., Chicago and New York.

AIR PUMPS.
Davidson, M. T., Co., New York.
Wheeler Condenser and Engineering Co., Carteret, N. J.

ALARMS—See WATER GAUGES AND ALARMS.

ALCOHOL ENGINES.
Mietz, A., New York.

ALLOYS, VANADIUM.
American Vanadium Co., Pittsburg, Pa.

ALUMINUM CASTINGS.
Lunkenheimer Co., Cincinnati, Ohio.
Vanadium Metals Company, Pittsburg, Pa.

ALUMINO VANADIUM.
American Vanadium Co., Pittsburg, Pa.

AMMETERS—See ELECTRICAL INSTRUMENTS.

AMMONIA PACKING.
Ferdinand, L. W., & Co., Boston, Mass.

AMMONIA PROOF HELMETS.
Hayward, S. F., & Co., New York.

ANCHORS.
American Ship Windlass Co., Philadelphia, Pa.
Baldt Anchor Co., Chester, Pa.

ANCHOR TRIPPERS.
American Ship Windlass Co., Philadelphia, Pa.

ANTI-FRICTION METAL.
Hyde Windlass Co., Bath, Maine.
Katzenstein, L., & Co., New York.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Ruggles-Coles Engineering Co., New York.
Vanadium Metals Company, Pittsburg, Pa.

ANTI-RUST COATINGS.
Ferdinand, L. W., & Co., Boston, Mass.

APPARATUS (MARINE GLUE MELTING).
Ferdinand, L. W., & Co., Boston, Mass.

ASBESTOS—See NON-CONDUCTING COVERING; also see PACKING, ASBESTOS.

ASBESTOS PACKING—See PACKING, ASBESTOS.

ASH HOISTS.
Davidson, M. T., Co., New York.
Hyde Windlass Co., Bath, Maine.
Williamson Bros. Co., Philadelphia, Pa.

ATTORNEYS—PATENT.
Decker, Delbert H., Washington, D. C.

AUTOMATIC INJECTORS.
Lunkenheimer Co., Cincinnati, Ohio.
Penberthy Injector Co., Detroit, Mich.

AUTOMATIC TOWING MACHINES—See TOWING MACHINES.

AUTOMATIC WATER GAUGES—See WATER GAUGES.

BABBITT METAL—See ANTI-FRICTION METAL.

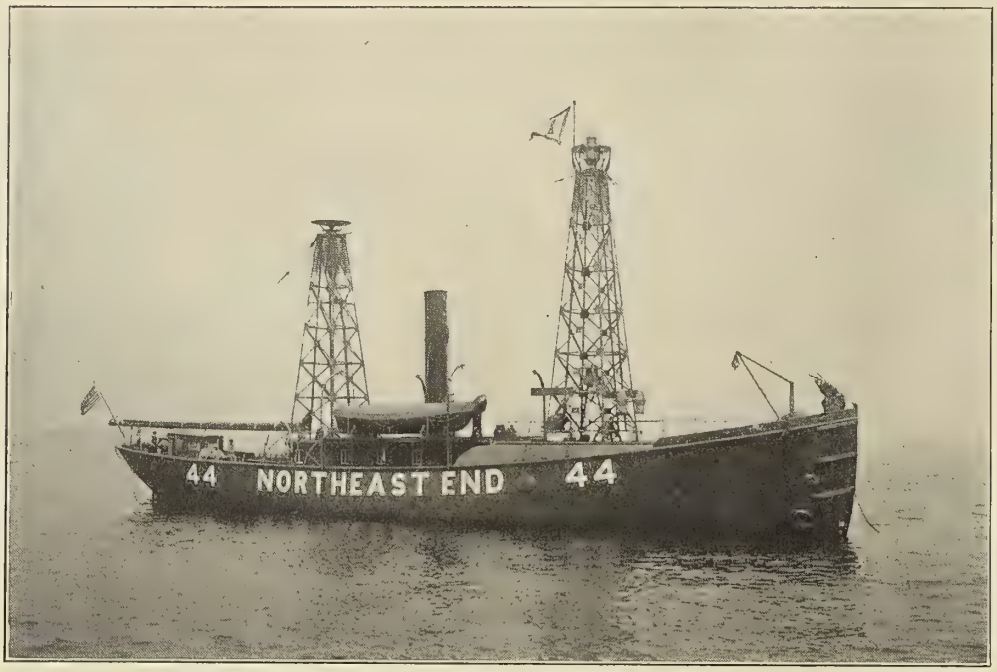
BALL BEARINGS—See THRUST BEARINGS.

BARGES—See SHIPBUILDERS.

# AMERICAN GASACCUMULATOR COMPANY

**Perry Bldg. PHILADELPHIA U.S.A.**

## Manufacturers of AGA Lighthouse Apparatus (Dal´ Patents)




The United States Lighthouse Bureau has installed the

**AGA SYSTEM**

at many of their most important light stations, among which are these well-known lights: Scotland Lightship, Frying Pan Shoals Lightship, Cornfield Lightship, Northeast End Lightship, etc.

**The New Ambrose Channel New York Harbor is lighted by**

**AGA BUOYS**

Other AGA Buoys are established at Nantucket Shoals, Point Judith, Montauk Point, Brigantine Shoals, Winter Quarter Shoals, Fenwick Island Shoals, Chesapeake Bay, Charleston Harbor, Hetzel Shoals, etc., etc.

**AGA BEACONS**

**and Buoys are in Use All Over the World**


BATH TUBS—ENAMELED IRON, PORCELAIN.
Sands, A. B., & Son Co., New York.

BEARINGS—See ANTI-FRICTION METAL; also THRUST BEARINGS.

BELLS.
Hayward, S. F., & Co., New York.
National Tube Co., Pittsburg, Pa.
Vanadium Metals Company, Pittsburg, Pa.

BELTING—See RUBBER BELTING.

BENCH TOOLS.
Billings & Spencer Co., Hartford, Conn.
Pratt & Whitney Co., New York.
Starrett, L. S., Co., Athol, Mass.
Williams & Co., J. H., Brooklyn, N. Y.

BENDING MACHINES, KEEL PLATE OR GARBOARD.
Niles-Bement-Pond Co., New York.

BENDING ROLLS—See ROLLS.

BILGE PUMPS—See PUMPS.

BITTS.
American Ship Windlass Co., Philadelphia, Pa.
Hyde Windlass Co., Bath, Maine.

BLACK PRINT PAPER.
Frey, Louis, & Co., New York.

BLOWERS.
American Blower Co., Detroit, Mich.
De Laval Steam Turbine Co., Trenton, N. J.
General Electric Co., Schenectady, N. Y.
Kerr Turbine Co., Wellsville, N. Y.
Sirocco Engineering Co.—See American Blower Co.
Sturtevant Co., B. F., Hyde Park, Mass.
Terry Steam Turbine Co., Hartford, Conn.

BLOW-OFF VALVES—See VALVES.

BLOWERS, SOOT—See SOOT BLOWERS.

BOAT ACCESSORIES.
Ferdinand, L. W., & Co., Boston, Mass.
International Acheson Graphite Co., Niagara Falls, N. Y.
Welin Davit and Lane & DeGroot Co,. Consol., Long Island City, N.Y.

BOAT BUILDERS—See LAUNCHES AND YACHTS.

BOAT DAVITS—See DAVITS.

BOAT FITTINGS.
Ferdinand, L. W., & Co., Boston, Mass.
Ruggles-Coles Engineering Co., New York.
Vanadium Metals Company, Pittsburg, Pa.
Welin Davit and Lane & DeGroot Co., Consol., Long Island City, N. Y.

BOATS—See LIFE BOATS; also LAUNCHES AND YACHTS.

BOILERS—Also see ENGINE BUILDERS—also SHIP BUILDERS.
Almy Water Tube Boiler Co., Providence, R. I.
Babcock & Wilcox Co., New York.
Bath Iron Works, Bath, Maine.
Griscom-Spencer Co., New York.
Hyde Windlass Co., Bath, Maine.
Kingsford Foundry & Machine Works, Oswego, N. Y.
Mosher Water Tube Boiler Co., New York.
Robb Engineering Co., South Framingham, Mass.
Roberts Safety Water Tube Boiler Co., Red Bank, N. J.
Ward, Chas., Engineering Works, Charleston, W. Va.

BOILER CIRCULATORS.
Ross Schofield Co., New York.
Schutte & Körting Co., Philadelphia, Pa.

BOILER COMPOUNDS.
Johns-Manville, H. W., Co., New York.

BOILER COVERING—See NON-CONDUCTING COVERING.

BOILER FEEDERS—See FEED-WATER REGULATORS.

BOILER-FLUE AND TUBE CLEANERS.
Griscom-Spencer Co., New York.
Independent Pneumatic Tool Co., Chicago and New York.
Johns-Manville, H. W., Co., New York.

BOILER FLUE AND TUBE CUTTERS.
Faessler, J., Mfg. Co., Moberly, Mo.
Griscom-Spencer Co., New York.
Independent Pneumatic Tool Co., Chicago and New York.
Johns-Manville, H. W., Co., New York.

BOILER FLUE AND TUBE EXPANDERS.
Faessler, J., Mfg. Co., Moberly, Mo.

BOILER AND PIPE COVERINGS—See NON-CONDUCTING COVERING.

BOILER RIVETS—Also see RIVETS.
Champion Rivet Co., Cleveland, Ohio.

BOILER ROOM FITTINGS.
American Blower Co., Detroit, Mich.
American Steam Gauge & Valve-Mfg. Co., Boston, Mass.
Ashton Valve Co., Boston, Mass.
Griscom-Spencer Co., New York.
Jerguson Gage & Valve Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
National Tube Co., Pittsburg, Pa.
Powell, Wm., Co., Cincinnati, Ohio.
Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.
Star Brass Mfg. Co., Boston, Mass.

# WESTON INSTRUMENTS

A. C. SWITCHBOARD - { AMMETERS, VOLTMETERS

A. C. PORTABLE - - { AMMETERS, MILLI-AMMETERS, VOLOMETERS

D. C. ECLIPSE SWITCHBOARD { AMMETERS, MILLI-AMMETERS, VOLTMETERS

These new instruments are **absolutely Dead-Beat ; Extremely Sensitive. Remarkably Accurate.** They require very little power for operation and are **very low in price.** The Alternating Current Instruments are **practically free** from **Temperature Error** and their Indications are **practically independent of frequency and also of wave form.** Correspondence regarding these and other of our many types of Electrical Measuring Instruments is solicited.

**WESTON ELECTRICAL INSTRUMENT COMPANY**

**New York Office. 114 Liberty St.** **NEWARK: N. J.**

**Chicago,** 1504 Monadnock Block.
**Boston,** 176 Federal St.
**Philadelphia,** 342 Mint Arcade.
**Birmingham,** Brown Marx Bldg.
**St. Louis,** 915 Olive St.
**Denver,** 231 15th Street.
**San Francisco,** 682 Mission St.
**New Haven,** 29 College St.
**Cleveland,** 1522 Prospect Ave.
**Montreal,** 410 St. James St.
**Paris,** 12 Rue St. Georges.
**Berlin,** Genest Str. 5, Schoenberg.
**Toronto,** 76 Bay St.
**Mexico,** 2a Capuchinas 40.
**London,** Audrey House, Ely Pl., Holborn.


BOILER STAYBOLTS—See STAYBOLTS.

BOILER TUBES.
National Tube Co., Pittsburg, Pa.

BOILER TUBE CUTTERS—See BOILER FLUE AND TUBE CUTTERS.

BOILER TUBE RETARDERS.
Griscom-Spencer Co., New York.

BOLTS AND NUTS.
National Tube Co., Pittsburg, Pa.

BOOKS.
Van Nostrand Co., D., New York.

BORING BARS—See CYLINDER BORING BARS.

BORING MACHINES—METAL WORKING.
Niles-Bement-Pond Co., New York.

BORING MACHINES—WOOD.
Independent Pneumatic Tool Co., Chicago and New York.

BORING AND TURNING MILLS.
Niles-Bement-Pond Co., New York.

BRASS AND COPPER—Also see YELLOW METAL; also MUNTZ METAL.
Ruggles-Coles Engineering Co., New York.
Vanadium Metals Company, Pittsburg, Pa.

BRASS CASTINGS.
Griscom-Spencer Co., New York.
Hyde Windlass Co., Bath, Maine.
Lunkenheimer Co., Cincinnati, Ohio.
Vanadium Metals Company, Pittsburg, Pa.

BRASS FITTINGS.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
Powell Co., Wm., Cincinnati, Ohio.
Ruggles-Coles Engineering Co., New York.
Star Brass Mfg. Co., Boston, Mass.

BRAZING MATERIALS.
Smooth-On Mfg. Co., Jersey City, N. J.

BRONZE.
Lunkenheimer Co., Cincinnati, Ohio.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Ruggles-Coles Engineering Co., New York.

BRONZE CASTINGS—See CASTINGS, BRONZE.

BRONZE-VANADIUM.
American Vanadium Co., Pittsburg, Pa.
Vanadium Metals Co., Pittsburg, Pa.

BUOYS.
American Gasaccumulator Co., Philadelphia, Pa.
Sands, A. B., & Son Co., New York.

BUOYS, LIGHT—See LIGHT BUOYS.

BUOYS, RING.
Ferdinand, L. W., & Co., Boston, Mass.

BURNERS, FUEL OIL—See FUEL OIL BURNERS.

BUSHINGS.
National Tube Co., Pittsburg, Pa.

BUTTERFLY VALVES—See VALVES.

BY-PASS VALVES—See VALVES.

CABLEWAYS—See MARINE CABLEWAYS.

CALORIMETERS—SEPARATING, THROTTLING, COAL.
Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.
Schutte & Körting Co., Philadelphia, Pa.

CANOE GLUE.
Ferdinand, L. W., & Co., Boston, Mass.

CANVAS—FOR LIGHTER COVERS, HATCH COVERS, TARPAULINS.
Bunker, E. A., New York.

CAPSTANS—STEAM—ELECTRIC—HAND.
American Ship Windlass Co., Philadelphia, Pa.
Hyde Windlass Co., Bath, Maine.

CARGO BLOCKS—See BLOCKS.

CASTINGS—BRONZE—Also see STEEL CASTINGS.
Griscom-Spencer Co., New York.
Hyde Windlass Co., Bath, Maine.
Lunkenheimer Co., Cincinnati, Ohio.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Ruggles-Coles Engineering Co., New York.
Vanadium Metals Co., Pittsburg, Pa.

CAST-IRON VANADIUM.
American Vanadium Co., Pittsburg, Pa.

CAST-STEEL VANADIUM.
American Vanadium Co., Pittsburg, Pa.

CEMENT-ASBESTOS.
Johns-Manville, H. W., Co., New York.

CEMENT-LINOLEUM.
Ferdinand, L. W., & Co., Boston, Mass.

CENTRIFUGAL PUMPS—See PUMPS.

# "DURABLE" WIRE ROPE

Is especially useful for

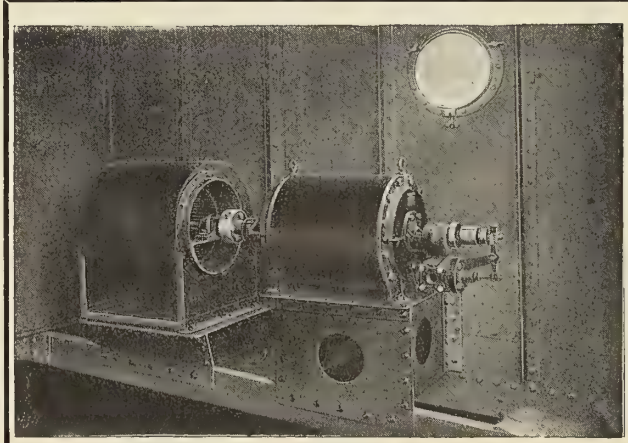
## SHIP'S RIGGING, TOWING HAWSERS, MOORING ROPES, DREDGING, HOISTING and Similar Uses

It is made of selected steel, and its construction is such that it combines the pliability and wearing surface of hemp with the strength of wire rope. It is rust-proof.
Send for detailed information.

## Durable Wire Rope Co.

93 PEARL STREET BOSTON, MASS.





"Sirocco"
TRADE MARK.

## Fans

### For Mechanical Draft and Ship Ventilation

have enormous volumetric capacities for small space requirements.

Being small, the cost of installation is brought down to the minimum.

Ships all over the world are equipped with "Sirocco" Fans.

Write for "Sirocco" Bulletin No. 284-ME.

AMERICAN BLOWER COMPANY
DETROIT, MICH.
U. S. A.


CHAIN PIPE WRENCHES—See WRENCHES.

CHAIN STOPPERS.
American Ship Windlass Co., Philadelphia, Pa.

CHANDLERY STORES.
Ferdinand, L. W., & Co., Boston, Mass.
Griscom-Spencer Co., New York.
Ostermoor & Co., New York.

CHECK VALVES—See VALVES.

CHRONOMETERS—See CLOCKS.

CHOCKS.
American Ship Windlass Co., Philadelphia, Pa.

CHUCKS.
Morse Twist Drill & Machine Co., New Bedford, Mass.

CIRCULATING PUMPS—See PUMPS.

CIRCULATORS.
Ross Schofield Co., New York.

CLASSIFICATION ASSOCIATION.
American Bureau of Shipping, New York.

CLOCKS.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Ashton Valve Co., Boston, Mass.
Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.
Star Brass Mfg. Co., Boston, Mass.

CLOTH—FOR LIGHTER COVERS, HATCH COVERS AND TARPAULINS.
Bunker, E. A., New York.

COATINGS, ANTI-RUST—See ANTI-RUST COATINGS.

COCKS—See GAUGE COCKS.

COAL HANDLING MACHINERY.
Lidgerwood Mfg. Co., New York.

COLLECTORS—PNEUMATIC.
Sturtevant Co., B. F., Hyde Park, Mass.

COMPANION FLANGES.
Lunkenheimer Co., Cincinnati, Ohio.

COMPOUNDS—See BOILER COMPOUNDS.

CONDENSERS.
Davidson, M. T., Co., New York.
Griscom-Spencer Co., New York.
Schutte & Körting Co., Philadelphia, Pa.
Wheeler Condenser and Engineering Co., Carteret, N. J.
Williamson Bros. Co., Philadelphia, Pa.

CONSULTING ENGINEERS—See ENGINEERS—Also PROFESSIONAL CARDS.

CONVEYING MACHINERY.
Lidgerwood Mfg. Co., New York.
Sturtevant Co., B. F., Hyde Park, Mass.

COOLERS, AIR—See AIR COOLERS.

COOLERS FOR OIL.
Schutte & Körting Co., Philadelphia, Pa.

COPPER—See BRASS AND COPPER.

CORDAGE—Also see ROPE and WIRE ROPE—Also TWINE.
Columbian Rope Co., Auburn, N. Y.
Durable Wire Rope Co., Boston, Mass.
Griscom-Spencer Co., New York.
Plymouth Cordage Co., North Plymouth, Mass.

CORK CEMENT, FENDERS, JACKETS, RINGS.
Armstrong Cork Co., Pittsburg, Pa.
Ferdinand, L. W., & Co., Boston, Mass.

CORRUGATED FURNACES.
Continental Iron Works, Brooklyn, N. Y.

COTTON DUCK—See CHANDLERY STORES.

COTTON RUBBER-LINED HOSE—See HOSE.

COUNTERS—See REVOLUTION COUNTERS.

COVERING, STEAM—See NON-CONDUCTING COVERING.

CRANES.
Niles-Bement-Pond Co., New York.
Welin Davit and Lane & DeGroot Co., Consol., Long Island City, N.Y.
Williamson Bros. Co., Philadelphia, Pa.

CRANK SHAFTS—See FORGINGS.

CUPRO-VANADIUM.
American Vanadium Co., Pittsburg, Pa.

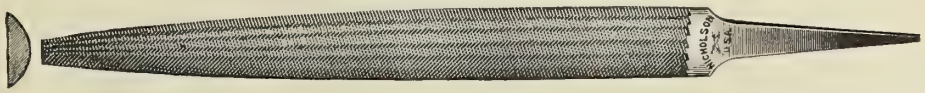
CUTTERS.
Morse Twist Drill & Machine Co., New Bedford, Mass.
Pratt & Whitney Co., New York.

CYLINDER BORING BARS.
Niles-Bement-Pond Co., New York.

CYLINDER RELIEF VALVES—See VALVES.

CYLINDERS FOR COMPRESSED AIR, GAS, ETC.
National Tube Co., Pittsburg, Pa.

CYLINDERS, VANADIUM.
American Vanadium Co., Pittsburg, Pa.



# You Get A New Nicholson File

if you find the slightest imperfection in any one that you buy. That's our protective guarantee.

Nicholson Files are made of the finest steel money can buy, tempered by the famous Nicholson process, and manufactured by expert file makers.

## Nicholson File Company

Providence, R. I., U. S. A.

NICHOLSON U.S.A.

Nicholson Files are made in 3500 different styles and sizes.

Write for a copy of "File Filosophy."

DAVITS.
Welin Davit and Lane & DeGroot Co,. Consol., Long Island City, N.Y.

DECK HOISTS—See HOISTING ENGINES.

DECK PLATES.
Sands, A. B., & Son Co., New York.

DECK PUMPS—See PUMPS.

DIAPHRAGM PUMPS—See PUMPS.
Hyde Windlass Co., Bath, Maine.

DIES.
Morse Twist Drill & Machine Co., New Bedford, Mass.
Pratt & Whitney Co., New York.

DIRECT-CONNECTED SETS—See ELECTRICAL PLANTS.

DISENGAGING GEARS.
Welin Davit and Lane & DeGroot Co., Consol., Long Island City, N.Y.

DISTILLERS—See EVAPORATORS.

DIVING APPARATUS.
Morse, Andrew J., & Son, Inc., Boston, Mass.

DRAFT, MECHANICAL—See MECHANICAL DRAFT.

DRAIN VALVES—See VALVES.

DRAWING PAPER.
Frey, Louis, & Co., New York.

DREDGING MACHINERY.
Williamson Bros. Co., Philadelphia, Pa.

DRILLING MACHINES, VERTICAL, HORIZONTAL AND RADIAL.
Niles-Bement-Pond Co., New York.
Pratt & Whitney Co., New York.

DRILLS.
Morse Twist Drill & Machine Co., New Bedford, Mass.
Pratt & Whitney Co., New York.

DRILLS, ELECTRIC—See ELECTRIC DRILLS.

DRILLS, PNEUMATIC—See PNEUMATIC TOOLS—Also AIR DRILLS.

DRILLS, PORTABLE—See PORTABLE DRILLS.

DROP FORGINGS—EYE BOLTS, HOOKS, ROPE SOCKETS, WRENCHES, ETC.
Billings & Spencer Co., Hartford, Conn.
Williams & Co., J. H., Brooklyn, N. Y.

DROP HAMMERS.
Billings & Spencer Co., Hartfod, Co.
Niles-Bement-Pond Co., New York,

DRY DOCKS AND MARINE RAILWAYS.
Merrill-Stevens Co., Jacksonville Fla.
Newport News Shipbuilding & Dry Dock Co., Newport News, Va.
Tietjen & Lang Dry Dock Co., Hoboken, N. J.

DRYING APPARATUS.
American Blower Co., Detroit, Mich.
Sturtevant Co., B. F., Hyde Park, Mass.

DYNAMOS—See ELECTRIC PLANTS; also STEAM TURBINE DYNAMOS.

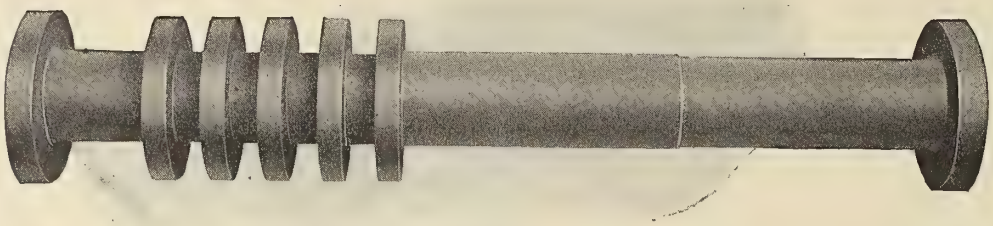
ECONOMIZERS, FUEL—See FUEL ECONOMIZERS.

EJECTORS.
Lunkenheimer Co., Cincinnati, Ohio.
Penberthy Injector Co., Detroit, Mich.
Schutte & Körting Co., Philadelphia, Pa.

ELECTRIC DRILLS.
General Electric Co., Schenectady, N. Y.
Independent Pneumatic Tool Co., Chicago and New York.
Johns-Manville, H. W., Co., New York.

ELECTRIC HEATERS.
General Electric Co., Schenectady, N. Y.
Simplex Electric Heating Co., Cambridgeport, Mass.

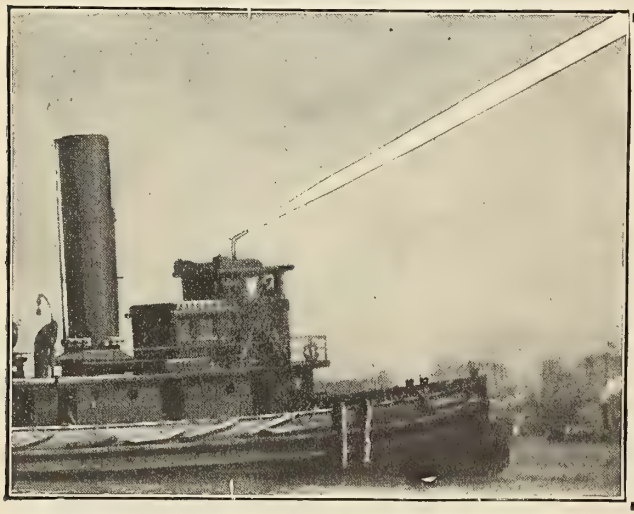
ELECTRIC HOISTS.
American Ship Windlass Co., Philadelphia, Pa.
General Electric Co., Schenectady, N. Y.
Hyde Windlass Co., Bath, Maine.
Lidgerwood Mfg. Co., New York.
Niles-Bement-Pond Co., New York.
Williamson Bros. Co., Philadelphia, Pa.



OPEN HEARTH
and
ALLOY STEEL FORGINGS
OF QUALITY

Rough Turned
or
Finished Complete

ERIE FORGE CO. ERIE, PA., U.S.A. *Write us about your requirements*

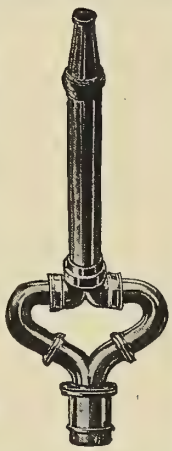


*LET US SEND YOU A*
UNIVERSAL NOZZLE
*ON TRIAL*

This is a flexible nozzle for stationary pipe or hose connection, and is specially designed FOR MARINE USE.

It can be turned in any direction, and will remain in position without attendance. Has many other attractive features.

*Send for Catalog and full particulars*



Sole Licensees
S. F. HAYWARD & CO.
*Established 1868*
39 Park Place NEW YORK
ANYTHING AND EVERYTHING FOR FIRE PROTECTION

ELECTRIC LIGHTS.
General Electric Co., Schenectady, N. Y.

ELECTRIC PLANTS.
General Electric Co., Schenectady, N. Y.
Sturtevant Co., B. F., Hyde Park, Mass.
Terry Steam Turbine Co., Hartford, Conn.

ELECTRICAL FITTINGS AND SUPPLIES—Also see ELECTRIC PLANTS.
General Electric Co., Schenectady, N. Y.
Griscom-Spencer Co., New York.
Johns-Manville, H. W., Co., New York.

ELECTRICAL INSTRUMENTS.
General Electric Co., Schenectady, N. Y.
Weston Electrical Instrument Co., Waverly Park, Newark, N. J

ELEVATORS, FREIGHT—See FREIGHT ELEVATORS, also INCLINED ELEVATORS.

ENGINE PACKING—See PACKING.

ENGINE-ROOM SUPPLIES—See STEAM SPECIALTIES.

ENGINEERS, CONSULTING AND CONTRACTORS.
Donnelly, W. T., New York.
Griscom-Spencer Co., New York.
Williamson Bros. Co., Philadelphia, Pa.

ENGINES FOR AUXILIARIES.
American Blower Co., Detroit, Mich.
American Ship Windlass Co., Philadelphia, Pa.
De Laval Steam Turbine Co., Trenton, N. J.
Hyde Windlass Co., Bath, Maine.
Kerr Turbine Co., Wellsville, N. Y.
Marine Iron Works, Chicago, Ill.
New London Ship & Engine Co., Groton, Conn.
Sturtevant Co., B. F., Hyde Park, Mass.
Terry Steam Turbine Co., Hartford, Conn.
Wheeler Condenser and Engineering Co., Carteret, N. J.

ENGINES, GASOLINE—See GASOLINE ENGINES.

ENGINES, HOISTING—See HOISTING ENGINES.

ENGINES, KEROSENE—See KEROSENE ENGINES.

ENGINES—OIL.
Mietz, A., New York.
New London Ship & Engine Co., Groton, Conn.

ENGINES—PROPELLING.
Bath Iron Works, Bath, Maine.
Kingsford Foundry & Machine Works, Oswego N. Y.
Marine Iron Works, Chicago, Ill.
Mietz, A., New York.
New London Ship & Engine Co., Groton, Conn.
Parsons Marine Steam Turbine Co., New York.
Sheriffs Mfg. Co., Milwaukee, Wis.
Trout, H. G., Co., Buffalo, N. Y.
Ward, Chas., Engineering Works, Charleston, W. Va.

ENGINE REGISTERS.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.

ENGINE-ROOM CLOCKS—See CLOCKS.

ESCALATORS.
Otis Elevator Co., New York.

EVAPORATORS.
Davidson, M. T., Co., New York.
Griscom-Spencer Co., New York.
Schutte & Körting Co., Philadelphia, Pa.
Wheeler Condenser and Engineering Co., Carteret, N. J.
Williamson Bros. Co., Philadelphia, Pa.

EXCESS PUMP GOVERNORS—See PUMP GOVERNORS.

EXHAUST FANS—See BLOWERS.

EXHAUST HEADS.
Sturtevant Co., B. F., Hyde Park, Mass.

EXPANDERS—See BOILER FLUE AND TUBE EXPANDERS.

EXPANSION JOINTS.
Griscom-Spencer Co., New York.
National Tube Co., Pittsburg, Pa.
Power Specialty Co., New York.

FANS—See BLOWERS.

FEED CHECK VALVES—See VALVES.

FEED-WATER HEATERS AND PURIFIERS.
Griscom-Spencer Co., New York.
Schutte & Körting Co., Philadelphia, Pa.
Wheeler Condenser and Engineering Co., Carteret, N. J.
Williamson Bros. Co., Philadelphia, Pa.

FEED-WATER REGULATORS.
Jerguson Gage & Valve Co., Boston, Mass.

FERRO-VANADIUM.
American Vanadium Co., Pittsburg, Pa.

FERRY BOAT LAMPS—See LAMPS.

FILES.
Nicholson File Co., Providence, R. I.

FILTERS.
Griscom-Spencer Co., New York.
Schutte & Körting Co., Philadelphia, Pa.

FIRE DEPARTMENT SUPPLIES.
Hayward, S. F., & Co., New York.
Morse, Andrew J., & Son, Inc., Boston, Mass.

FIRE EXTINGUISHERS.
Hayward, S. F., & Co., New York.
Morse, Andrew J., & Son, Inc., Boston, Mass.

FIRE HOSE—See HOSE.

FIREPROOF CONSTRUCTION.
Johns-Manville, H. W., Co., New York.

FIREPROOF LUMBER—See LUMBER, FIREPROOF.

FIRE PUMPS—See PUMPS.

FLANGES.
Dart, E. M., Mfg. Co., Providence, R. I.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
National Tube Co., Pittsburg, Pa.

FLANGING PRESSES.
Niles-Bement-Pond Co., New York.
Watson-Stillman Co., New York.

FLEXIBLE SHAFTING.
Stow Mfg. Co., Binghamton, N. Y.

FLOATING DRY DOCKS—See DRY DOCKS.

FLUE CLEANERS—See BOILER FLUE CLEANERS.

FLUE CUTTERS—See BOILER FLUE AND TUBE CUTTERS.

FORCED DRAFT—See also BLOWERS.
American Blower Co. and Sirocco Engineering Co., Detroit, Mich.
De Laval Steam Turbine Co., Trenton, N. J.
General Electric Co., Schenectady, N. Y.
Sturtevant Co., B. F., Hyde Park, Mass.

FORGES.
Sturtevant Co., B. F., Hyde Park, Mass.

FORGINGS, BRONZE—See also DROP FORGINGS.
Erie Forge Co., Erie, Pa.
Hyde Windlass Co., Bath, Me.
Vanadium Metals Co., Pittsburg, Pa.

FORGINGS, OPEN HEARTH STEEL.
Erie Forge Co., Erie, Pa.

FORGINGS, VANADIUM.
American Vanadium Co., Pittsburg, Pa.

FREIGHT ELEVATORS FOR DOCKS AND WHARVES.
Otis Elevator Co., New York.

FROSTPROOF COVERINGS.
Ferdinand, L. W., & Co., Boston, Mass.

FUEL ECONOMIZERS.
Griscom-Spencer Co., New York.
Power Specialty Co., New York.
Sturtevant Co., B. F., Hyde Park, Mass.

FUEL OIL BURNERS.
Schutte & Körting Co., Philadelphia, Pa.

FURNACES—Also see CORRUGATED FURNACES.
Continental Iron Works, New York.

FUSIBLE PLUGS.
Griscom-Spencer Co., New York.

GALLEYS—See RANGES.

GAS BLOWERS AND EXHAUSTERS.
American Blower Co., Detroit, Mich.
Schutte & Körting Co., Philadelphia, Pa.
Sturtevant Co., B. F., Hyde Park, Mass.

GASKETS—Also see PACKING.
Crandall Packing Co., Palmyra, N. Y.
Griscom-Spencer Co., New York.
Johns-Manville, H. W., Co., New York.
Katzenstein & Co., L., New York.
New York Belting & Packing Co., Ltd., New York.
Peerless Rubber Mfg. Co., New York.
Power Specialty Co., New York.
Smooth-On Mfg. Co., Jersey City, N. J.
Vanda Co., New York.

GASOLINE ENGINES—Also see LAUNCHES AND YACHTS; also KEROSENE ENGINES—Also OIL ENGINES.
Bridgeport Motor Co., Bridgeport, Conn.
Buffalo Gasoline Motor Co., Buffalo, N. Y.
Mietz, A., New York.
Standard Motor Construction Co., Jersey City, N. J.

GAS ENGINE SPECIALTIES.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
Powell, Wm., Co., Cincinnati, Ohio.
Star Brass Mfg. Co., Boston, Mass.

GAS PRODUCERS—See MARINE GAS PRODUCERS

GATE VALVES—See VALVES.

GAUGE COCKS.
American Steam Gauge and Valve Mfg. Co., Boston, Mass.
Jerguson Gage & Valve Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
National Tube Co., Pittsburg, Pa.
Powell, Wm., Co., Cincinnati, Ohio
Star Brass Mfg. Co., Boston, Mass.

GAUGES—See STEAM GAUGES.


# "Sands" Sanitary Fixtures
## USED ALL OVER THE WORLD

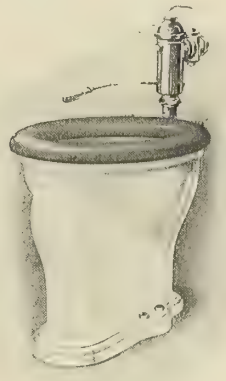


PLATE S-54

The "Navahoe" Washdown Deep Seal Closet, with N. P. composition "Utilis" flush valve, controlling valve. Heavy oak seat, with N. P. brass post hinges, brass floor plate rubber gasket, bolts and nuts.

Complete, $38.00.
If mahogany seat, add $1.50.

DIMENSIONS:

15 ins. wide, 21 ins. front to back, 18 ins. high to top of seat, center of outlet from wall 13 ½ ins., center of inlet from floor 20 ins.

Weight, net, 55 lbs.; gross 85 lbs.

The above fixture is suitable for use above the water line only, has extra heavy bowl, and largely used for general toilet rooms.

Pressure required to operate valve, not less than 15 pounds.

The "Utilis" flush valve is made with side inlet and short nipple; also with close drop elbow for iron pipe connections, with or without controlling cock. For marine use the side inlet valve is always sent, unless otherwise ordered.

Send for *CATALOGUE "E"* showing large assortment of *Marine Plumbing Specialties*, free upon application.

A. B. SANDS & SON COMPANY

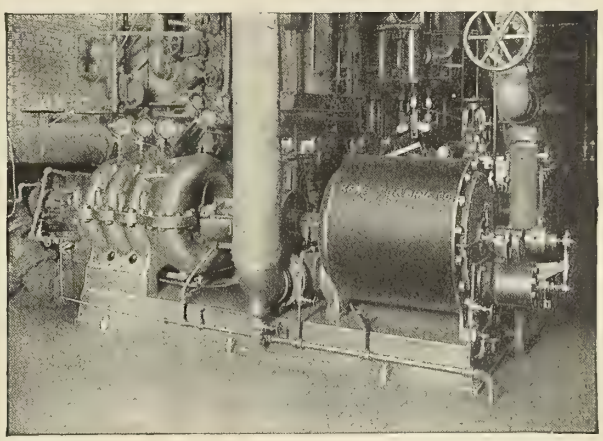
1849 "Pioneers for Over 60 Years" 1912

Largest Manufacturers in the World of

*MARINE PLUMBING SPECIALTIES*

22-24 Vesey St., New York, U.S.A.





## THIS KERR TURBO-PUMP FEEDS 12,000 H.P. OF BOILERS

This 1000-gallon-per-minute turbo-pump is doing satisfactorily what four duplex reciprocating pumps would not do in feeding the 32—375 h.p. boilers in Armour & Company's Chicago Stockyards plant. For over two years this unit has been in constant service, maintaining a feed line pressure of 140 lbs., and has often run for weeks at a time, day and night, without a shutdown.

Isn't this pretty good and worth the serious consideration of all boiler users, especially that the pump delivers at uniformly even pressure, has no frictional contacts inside, uses little packing and lubricants, uses no more steam than a reciprocating pump of equal duty, involves practically no expense for any supplies, has no "adjustable parts" to require constant attention, always looks neat and clean, costs no more than a reciprocating unit of equal duty, goes into less space, and delivers its exhaust free from oil and in the best possible condition for reuse?

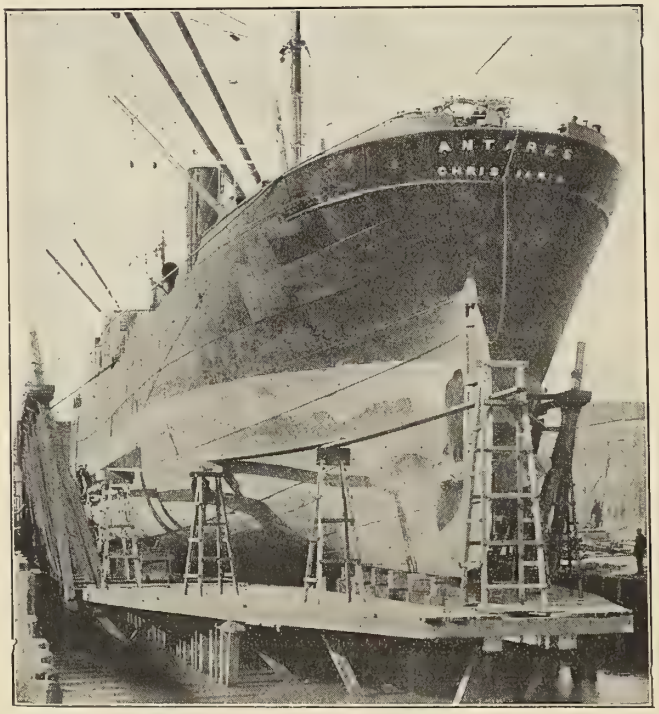
*Send for our New Catalog*

KERR TURBINE COMPANY

STEAM KERR TURBINE Wellsville, New York

Agents in all large cities 40

# RAILWAY DRY DOCKS



**Designed and Built for All Classes and Types of Vessels**

**Timber and Steel Construction**

**H.I. CRANDALL & SON CO.**

**EAST BOSTON, MASS.**


GAUGE GLASSES.
Jerguson Gage & Valve Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.

GAUGE TESTERS.
American Steam Gauge and Valve Mfg. Co., Boston, Mass.

GEARS, VANADIUM.
American Vanadium Co., Pittsburg, Pa.

GENERATORS—See ELECTRIC PLANTS.

GLOBE VALVES—See VALVES.

GLUE—LINOLEUM, MARINE, SHIP, YACHT, WATERPROOF.
Ferdinand, L. W., & Co., Boston, Mass.

GONGS.
National Tube Co., Pittsburg, Pa.
Vanadium Metals Co., Pittsburg, Pa.

GOVERNORS—See PUMP GOVERNORS.

GRABS—See DREDGING MACHINES.

GRAPHITE.
Dixon, Jos., Crucible Co., Jersey City, N. J.
International Acheson Graphite Co., Niagara Falls, N. Y.

GRATE BARS.
Griscom-Spencer Co., New York.

GREASE—See LUBRICANTS.

GREASE CUPS—See LUBRICATORS.
Albany Lubricating Co., New York.
Cook's Sons, Adam, New York.
Griscom-Spencer Co., New York.
McNab & Harlin Mfg. Co., New York.

GREASE EXTRACTORS.
American Steam Gauge and Valve Mfg. Co., Boston, Mass.
Griscom-Spencer Co., New York.

GYPSEYS.
American Ship Windlass Co., Philadelphia, Pa.
Hyde Windlass Co., Bath, Maine.

HAMMERS, PNEUMATIC—See PNEUMATIC TOOLS.

HARDWARE—See CHANDLERY STORES.

HAWSERS—See WIRE ROPE.

HEATERS—BATH, LAVATORY, SHOWER.
Sands, A. B., & Son Co., New York.
Schutte & Körting Co., Philadelphia, Pa.

HEATING AND VENTILATING APPARATUS.
American Blower Co., Detroit, Mich.
Schutte & Körting Co., Philadelphia, Pa.
Sturtevant Co., B. F., Hyde Park, Mass.

HELMETS, SMOKE AND AMMONIA.
Hayward, S. F., & Co., New York.

HEMP—See TWINE.

HOISTING ENGINES.
American Ship Windlass Co., Philadelphia, Pa.
Hyde Windlass Co., Bath, Maine.
Lidgerwood Mfg. Co., New York.
Williamson Bros. Co., Philadelphia, Pa.

HOISTS, ELECTRIC—See ELECTRIC HOISTS.

HOSE—See AIR HOSE.
Eureka Fire Hose Mfg. Co., New York.
Hayward, S. F., & Co., New York.
Independent Pneumatic Tool Co., Chicago and New York.
New York Belting & Packing Co., Ltd., New York.

HOSE COUPLING.
Eureka Fire Hose Co., New York.
Hayward, S. F., & Co., New York.
Independent Pneumatic Tool Co., Chicago and New York.
McNab & Harlin Mfg. Co., New York.
National Tube Co., Pittsburg, Pa.
Vanadium Metals Company, Pittsburg, Pa.

HOSE NOZZLES.
Hayward, S. F., & Co., New York.
McNab & Harlin Mfg. Co., New York.
Morse, Andrew J., Son, Inc., Boston, Mass.
Vanadium Metals Co., Pittsburg, Pa.

HOSE REELS AND RACKS.
Hayward, S. F., & Co., New York.

HYDRAULIC FITTINGS.
McNab & Harlin Mfg. Co., New York.
Powell, Wm., Co., Cincinnati, Ohio.
Schutte & Körting Co., Philadelphia, Pa.
Watson-Stillman Co., New York.

HYDRAULIC JACKS.
Watson-Stillman Co., New York.

HYDRAULIC MACHINERY—RIVETERS, PUNCHES, SHEARS.
Niles-Bement-Pond Co., New York.
Watson-Stillman Co., New York.

ICE MACHINES—See REFRIGERATING PLANTS.

INCLINED ELEVATORS FOR DOCKS AND WHARVES.
Otis Elevator Co., New York.

INDICATOR CONNECTIONS.
Lunkenheimer Co., Cincinnati, Ohio.

INDICATORS—STEAM AND GAS ENGINE.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
Powell Co., The, Wm., Cincinnati, Ohio.
Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.
Star Brass Mfg. Co., Boston, Mass.

INDUCED DRAFT.
American Blower Co., Detroit, Mich.
Sturtevant Co., B. F., Hyde Park, Mass.

INJECTORS.
Lunkenheimer Co., Cincinnati, Ohio.
Penberthy Injector Co., Detroit, Mich.
Powell Co., The, Wm., Cincinnati, Ohio.
Schutte & Körting Co., Philadelphia, Pa.

INTERLOCKING RUBBER TILING.
Griscom-Spencer Co., New York.
New York Belting & Packing Co., Ltd., New York.

IRON CEMENT.
Smooth-On Mfg. Co., Jersey City, N. J.

JACKS—PNEUMATIC.
Independent Pneumatic Tool Co., Chicago and New York.

JACKS FOR UNCOUPLING SHAFTS.
Watson-Stillman Co., New York.

JOURNAL BEARINGS—See THRUST BEARINGS.

JUTE.
Columbian Rope Co., Auburn and New York.

KEROSENE ENGINES.
Mietz, A., New York.

LATHES, CRANK SHAFT.
Niles-Bement-Pond Co., New York.

LAMPS, SIGNALS, AND FIXTURES.
Carlisle & Finch Co., Cincinnati, Ohio.
General Electric Co., Schenectady, N. Y.
Johns-Manville, H. W., Co., New York.

LATHES, ENGINE.
Niles-Bement-Pond Co., New York.
Pratt & Whitney Co., New York.

LATHES, TURRET.
Niles-Bement-Pond Co., New York.
Pratt & Whitney Co., New York.

LAUNCHES AND YACHTS—See also SHIPBUILDERS AND DRY DOCK COMPANIES.
Bridgeport Motor Co., Bridgeport, Conn.
Buffalo Gasolene Motor Co., Buffalo, N. Y.
Marine Iron Works, Chicago, Ill.
Standard Motor Construction Co., Jersey City, N. J.
Ward, Chas., Engineering Works, Charleston, W. Va.
Welin Davit and Lane & DeGroot Co., Consol., Long Island City, N.Y.

LAVATORIES—FOLDING, STATIONARY, STATEROOM.
Sands, A. B., & Son Co., New York.

LAVATORY AND BATH HEATERS.
Griscom-Spencer Co., New York.
Schutte & Körting Co., Philadelphia, Pa.

LIFE BOATS AND RAFTS.
Welin Davit and Lane & DeGroot Co., Consol., Long Island City, N.Y.

LIFE GUNS.
Hayward, S. F., & Co., New York.

LIFE PRESERVERS.
Armstrong Cork Co., Pittsburg, Pa.
Ferdinand, L. W., & Co., Boston, Mass.
Welin Davit and Lane & DeGroot Co., Consol., Long Island City, N.Y.

LIFE-SAVING DEVICES.
Hayward, S. F., & Co., New York.
Welin Davit and Lane & DeGroot Co., Consol., Long Island City, N.Y.

LIGHTS.
American Gasaccumulator Co., Philadelphia, Pa.

LIGHT BUOYS.
American Gasaccumulator Co., Philadelphia, Pa.

LIGHTHOUSE APPARATUS.
American Gasaccumulator Co., Philadelphia, Pa.

LINOLEUM CEMENT.
Ferdinand, L. W., & Co., Boston, Mass.

LIQUID GLUE, WATERPROOF.
Ferdinand, L. W., & Co., Boston, Mass.

LOG REGISTERS.
Nicholson Ship Log Co., Cleveland, Ohio.
Schuette Recording Compass Co., Manitowoc, Wis.
Welin Davit and Lane & DeGroot Co., Consol., Long Island City, N.Y.

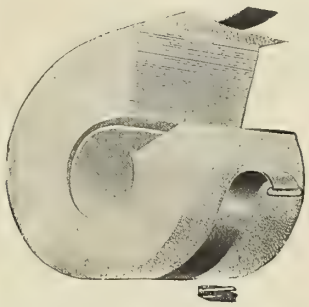
LUBRICANTS.
Albany Lubricating Co., New York.
Cook's Sons, Adam, New York.
Dixon, Jos., Crucible Co., Jersey City, N. J.
International Acheson Graphite Co., Niagara Falls, N. Y.
Power Specialty Co., New York.

LUBRICATING COMPOUND.
Albany Lubricating Co., New York.
Cook's Sons, Adam, New York.
International Acheson Graphite Co., Niagara Falls, N. Y.

LUBRICATORS.
Albany Lubricating Co., New York.
Cook's Sons, Adam, New York.
Griscom-Spencer Co., New York.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
Powell, Wm., Co., Cincinnati, Ohio.
Schutte & Körting Co., Philadelphia, Pa.

MACHINE TOOLS—See TOOLS, MACHINE.

MANGANESE BRONZE CASTINGS—Also see BRONZE.
Griscom-Spencer Co., New York.
Hyde Windlass Co., Bath, Maine.
Lunkenheimer Co., Cincinnati, Ohio.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Ruggles-Coles Engineering Co., New York.

J-M
Asbesto-Sponge
Felted
Pipe Covering

The Ideal Insulator for High Pressure Pipes

Made up in laminated form, like the leaves of a book, J-M Asbesto-Sponge Felted Pipe Covering confines a large number of small particles of dead air between the layers. Thus maximum insulating efficiency is secured. The layers consist of thin felts composed of pure Asbestos fibres and finely ground sponge, forming a real cellular fabric.

J-M Asbesto-Sponge Felted Pipe Covering is tough yet flexible, and is practically everlasting. It can be removed and replaced as often as required, without injuring its efficiency. For high pressure and superheated steam pipes it has been proved by years of severe testing to be without an equal as an insulator.

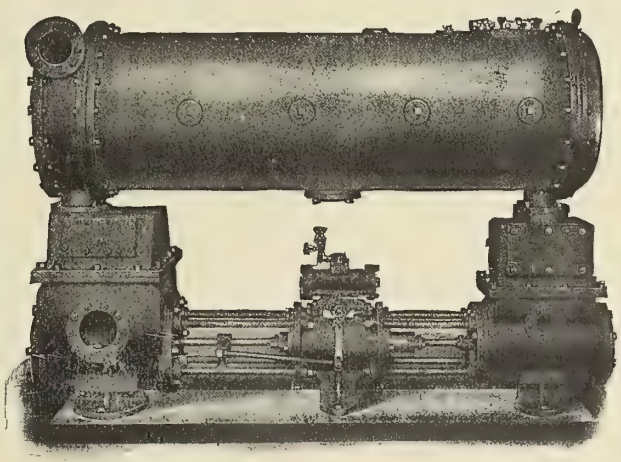
*Write nearest Branch for Sample and Booklet.*

H. W. JOHNS-MANVILLE CO.

Baltimore, Boston, Chicago, Cleveland, Dallas, Detroit, Kansas City, Los Angeles, Milwaukee, Minneapolis, New Orleans, New York, Omaha, Philadelphia, Pittsburgh, San Francisco, Seattle, St. Louis (1513)

For Canada—THE CANADIAN H. W. JOHNS-MANVILLE CO., LTD
Toronto, Ont. Montreal, Que. Winnipeg, Man. Vancouver, B. C.

DAVIDSON
PUMPS



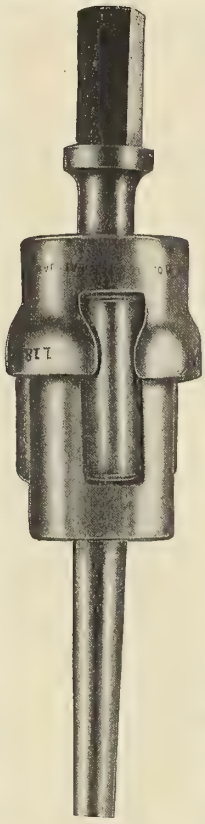
HORIZONTAL AND VERTICAL
MARINE PUMPS *for ALL Services*
CONDENSERS—EVAPORATORS—ASH EJECTORS
M. T. DAVIDSON CO.
154 Nassau Street, NEW YORK

**ARMSTRONG SOLID BLOCK LIFE PRESERVERS**
STANDARD FOR MATERIAL AND WORKMANSHIP
Each Preserver inspected and stamped by U. S. Inpector
YACHT FENDERS—BUOYS
**ARMSTRONG CORK COMPANY**
Boston New York Philadelphia Pittsburgh Chicago
St. Louis Baltimore Cincinnati

**JEFFERY'S MARINE YACHT GLUE**
Has no equal for paying seams of yachts' decks
*Send for circulars, samples, etc.*
**L. W. FERDINAND & CO., 201 South St. Boston, Mass., U. S. A.**

**EUREKA FIRE HOSE**
*Awarded Gold Medal at the St. Louis Exposition for Superiority of Our Goods*

TRADE-MARK.
**SAFEST AND BEST**
FULLY TESTED AND MADE TO LAST
"A word to the wise is sufficient"
Seamless Woven and Rubber-Lined
EUREKA FIRE HOSE
**"PARAGON" BRAND Has No Equal**
*SEND FOR SAMPLE*
**EUREKA FIRE HOSE MFG. CO.**
New York, N. Y.; Boston, Mass.; Chicago, Ill.; Philadelphia, Pa.; Columbus, Ohio; Atlanta, Ga.; Dallas, Texas; Minneapolis, Minn.; Denver, Colo.; Seattle, Wash.; Syracuse, N. Y.
Kansas City, Mo.; Detroit, Mich.; Omaha, Neb.; San Francisco, Cal.


**BUY ONLY EXPANDERS THAT YOU KNOW ARE RIGHT**
THE use of our product by the United States Government, in leading American boiler shops and in every civilized country on the globe should convince that Faessler Tools are the recognized standard.
The expander shown is unquestionably the strongest and most durable on the market, for it embodies the best steel we can buy and is hardened most carefully. The rollers of the three standard types are double length and reversible, hence give **double** the service of ordinary rollers, and are interchangeable, which is a big convenience where a number of expanders are in use.
We haven't space to describe these tools fully, but you can find out more about them and our other products by reading our Catalog No 27. Write for it.
**J. FAESSLER MFG. CO.**
**MOBERLY, MO.**
810 OLIVE STREET, ST. LOUIS, MO. 7

MAGNESIA COVERINGS.
Johns-Manville, H. W., Co., New York.

MANILA AND SISAL ROPE—See ROPE; also CORDAGE.

MARINE BOILER COMPOUNDS—See BOILER COMPOUNDS.

MARINE CABLEWAYS.
Lidgerwood Mfg. Co., New York.

MARINE ENGINES—See ENGINES, PROPELLING.

MARINE FORGINGS—See FORGINGS.

MARINE GAS PRODUCERS.
Marine Producer Gas Power Co., New York.

MARINE GLUE.
Ferdinand, L. W., & Co., Boston, Mass.

MARINE HARDWARE.
Ferdinand, L. W., & Co., Boston, Mass.

MARINE LAMPS—See LAMPS.

MARINE RAILWAY BUILDERS—See RAILWAY DRY DOCKS.
Crandall, H. I., & Son Co., East Boston, Mass.

MARINE RANGES—See RANGES.

MARINE SIGNALS—See SIGNALS.

MARINE SUPPLIES.
Ferdinand, L. W., & Co., Boston, Mass.

MASTS, STEEL.
Welin Davit and Lane & DeGroot Co., Consol., Long Island City, N.Y.

MATTRESSES.
Ostermoor & Co., New York.

MECHANICAL DRAFT.
American Blower Co., Detroit, Mich.
Sturtevant Co., B. F., Hyde Park, Mass.

MEGAPHONES—See CHANDLERY STORES.

METAL POLISH.
Hoffman, George W., Indianapolis, Ind.

METAL WORKING TOOLS—See TOOLS, MACHINE.

METALLIC PACKING—Also see PACKING.
Katzenstein, L., & Co., New York.
Power Specialty Co., New York.
United States Metallic Packing Co., Philadelphia, Pa.

METRES, ELECTRIC.
General Electric Co., Schenectady, N. Y.
Weston Electrical Instrument Co., Waverly Park, Newark, N. J.

MILLING MACHINES.
Niles-Bement-Pond Co., New York.
Pratt & Whitney Co., New York.

MINERAL WOOL—See NON-CONDUCTING COVERING.

MONEL METAL.
Ruggles-Coles Engineering Co., New York.

MONITOR NOZZLES—See HOSE NOZZLES.

MOORING ENGINES.
American Ship Windlass Co., Philadelphia, Pa.
Hyde Windlass Co., Bath, Maine.
Williamson Bros. Co., Philadelphia, Pa.

MOTOR BOATS—See LAUNCHES AND YACHTS.

MOTOR BOAT SUPPLIES.
Ferdinand, L. W., & Co., Boston, Mass.

MOTORS, ELECTRIC.
General Electric Co., Schenectady, N. Y.

MOTORS, GASOLINE—See GASOLINE ENGINES.

MULTIPLE DRILLS.
Niles-Bement-Pond Co., New York.
Pratt & Whitney Co., New York.

MULTI-SPEED MOTORS.
Stow Mfg. Co., Binghamton, N. Y.

NAVAL ARCHITECTS—See PROFESSIONAL CARDS.

NEEDLE VALVES—See VALVES.

NON-CONDUCTING COVERING.
Johns-Manville, H. W., Co., New York.

NOZZLES—See HOSE NOZZLES.

NUTS—See BOLTS AND NUTS.

OAKUM.
Baltimore Oakum Co., Baltimore, Md.
Davey, W. O., & Sons, Jersey City, N. J.
Welin Davit and Lane & DeGroot Co., Consol., Long Island City, N.Y.

OIL—See LUBRICANTS.

OIL BURNERS, FUEL—See FUEL OIL BURNERS.

OIL CUPS—See LUBRICATORS.

OIL FUEL APPARATUS.
Schutte & Körting Co., Philadelphia, Pa.

OILDAG.
International Acheson Graphite Co., Niagara Falls, N. Y.

OIL ENGINES—See ENGINES, OIL.

OIL GAUGES.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
Powell Co., The, Wm., Cincinnati, Ohio.
Star Brass Mfg. Co., Boston, Mass.

OIL POLISH—See METAL POLISH.

OIL PUMPS.
Lunkenheimer Co., Cincinnati, Ohio.
Star Brass Mfg. Co., Boston, Mass.

OILING SYSTEMS—Also see LUBRICATORS.
Albany Lubricating Co., New York.
Cook's Sons, Adam, New York.
Powell Co., Wm., Cincinnati, Ohio.
Schutte & Körting Co., Philadelphia, Pa.


*When writing to advertisers, please mention* INTERNATIONAL MARINE ENGINEERING.

PACKING—Also see METALLIC PACKING.
Crandall Packing Co., Palmyra, N. Y.
Johns-Manville, H. W., Co., New York.
New York Belting & Packing Co., Ltd., New York.
Peerless Rubber Mfg. Co., New York.
Power Specialty Co., New York.
Vanda Co., New York.

PACKING, ASBESTOS.
Crandall Packing Co., Palmyra, N. Y.
Johns-Manville, H. W., Co., New York.

PAINT—Also see GRAPHITE; also MARINE PAINT.
Dixon, Jos., Crucible Co., Jersey City, N. J.
International Acheson Graphite Co., Niagara Falls, N. Y.

PATENT ATTORNEYS—See ATTORNEYS, PATENT.

PETROL ENGINES—See GASOLINE ENGINES.

PHOSPHOR BRONZE CASTINGS.
Griscom-Spencer Co., New York.
Hyde Windlass Co., Bath, Maine.
Lunkenheimer Co., Cincinnati, Ohio.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.

PIPE COVERING—See NON-CONDUCTING COVERING.

PIPE CUTTING AND THREADING MACHINES.
Niles-Bement-Pond Co., New York.

PIPE FLANGES—See FLANGES.

PIPE UNIONS.
Dart, E. M., Mfg. Co., Providence, R. I.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
National Tube Co., Pittsburg, Pa.
Powell Co., The, Wm., Cincinnati, Ohio.

PIPE WRENCHES.
Billings & Spencer Co., Hartford, Conn.
McNab & Harlin Mfg. Co., New York.
Williams & Co., J. H., Brooklyn, N. Y.

PLANERS, STANDARD METAL WORKING AND ROTARY.
Niles-Bement-Pond Co., New York.

PLANERS, SHIP PLATE.
Niles-Bement-Pond Co., New York.

PLANIMETERS.
American Steam Gauge and Valve Mfg. Co., Boston, Mass.

PLATE-BENDING ROLLS.
Niles-Bement-Pond Co., New York.

PLUMBAGO—Also see GRAPHITE.
Dixon, Jos., Crucible Co., Jersey City, N. J.
International Acheson Graphite Co., Niagara Falls, N. Y.

PLUMBING—Also see CHANDLERY STORES.
Davidson, M. T., Co., New York.
Sands, Alfred B., & Son Co., New York.

PNEUMATIC SEPARATORS.
Sturtevant Co., B. F., Hyde Park, Mass.

PNEUMATIC TOOLS—Also see AIR COMPRESSORS.
Independent Pneumatic Tool Co., Chicago and New York.

POLISH—See METAL POLISH.

POPPET VALVES—See VALVES.

PORTABLE CYLINDER BORING BARS—See CYLINDER BORING BARS.

PORTABLE DRILLS.
General Electric Co., Schenectady, N. Y.
Stow Mfg. Co., Binghamton, N. Y.

POWER PUNCHES AND SHEARS—See TOOLS, MACHINE.

PRODUCERS—See MARINE GAS PRODUCERS.

PROFESSIONAL CARDS.
Cox & Stevens, New York.
Decker, Delbert H., Washington, D. C.
Donnelly, W. T., New York.
Stearns, W. B., Boston, Mass.

PROJECTORS—See SEARCHLIGHTS.

PROPELLER WHEELS.
Donnelly, W. T., New York.
Hyde Windlass Co., Bath, Me.
Roelker, H. B., New York.
Ruggles-Coles Engineering Co., New York.
Sheriffs Mfg. Co., Milwaukee, Wis.
Trout, H. G., Co., Buffalo, N. Y.
Vanadium Metals Co., Pittsburg, Pa.

PROPELLING ENGINES—See ENGINES, PROPELLING.

PUMPS.
Blake & Knowles Steam Pump Works, New York.
Davidson, M. T., Co., New York.
De Laval Steam Turbine Co., Trenton, N. J.
Griscom-Spencer Co., New York.
Hyde Windlass Co., Bath, Maine.
Kingsford Foundry & Machine Works, Oswego, N. Y.
Sands, A. B., & Son Co., New York.
Terry Steam Turbine Co., Hartford, Conn.
Wheeler Condenser and Engineering Co., Carteret, N. J.


VANDA
PACKINGS

SHEET

Saturated and Superheated Steam. Air, Hot Water, Ammonia Acids, Oil, Etc. Highest Temperature and Pressure.

PISTON

Thoroughly Lubricated. Gives Greatest Satisfaction Square and Round, Coil and Spiral.

VANDA FIBRE VALVE STEM PACKING
STYLE Nº 100

VANDA FIBRE SPIRAL PISTON PACKING
(SQUARE)
STYLE Nº 50

THE VANDA COMPANY
96 SPRING ST. NEW YORK

PROFESSIONAL CARDS

Irving Cox
Edwin A. Stevens

Daniel H. Cox
Edwin A. Stevens, Jr.

COX & STEVENS
Telephone 1375 Broad
Consulting Engineers, Naval Architects, Marine Engineers
15 WILLIAM STREET NEW YORK

WILLIAM T. DONNELLY
Consulting Engineer and Naval Architect
17 BATTERY PLACE, NEW YORK
DESIGNER OF FLOATING DRY DOCKS STEEL AND WOOD
PLANS ON HAND FOR DOCKS FROM 1,000 TO 10,000 TONS
Write for information on Mechanical Lift Dock for Small Vessels

W. B. STEARNS, M. I. N. A.
Naval Architect, Consulting Engineer
HEAVY OIL AND PRODUCER GAS VESSELS DESIGNED AND CONSTRUCTION SUPERVISED,
ECONOMY AND PERFORMANCE GUARANTEED
SEVENTEEN YEARS' EXPERIENCE
15 CUSTOMHOUSE STREET, BOSTON, U.S.A.

The Bertsch Imported Positive
BLACK PRINT PAPER
DIRECT PROCESS WATERBATH ONLY
*Look out for Trade Mark* *Beware of Imitations*
COMES IN WHITE, TINTED AND WATER-COLOR PAPERS. ALSO CLOTH
No negative required. Excellent results. Keeps longer than any other sensitized paper. Does not become brittle. Ask your dealer.
All Prominent Drawing Material Houses Keep It
LOUIS FREY & CO. Sole Agents for U.S.
116 WILLIAM STREET NEW YORK

# MACHINE TOOLS FOR SHIPYARDS AND MARINE ARSENALS

Marine Engineers and Shipyard Officials furnished on request with our book "Ship and Navy Yard Equipments"

## NILES-BEMENT-POND CO.

111 BROADWAY, NEW YORK
25 VICTORIA STREET, LONDON

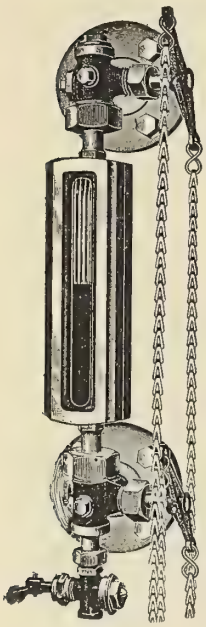
## Wheeler Condenser & Engineering Co.

Surface Condensers, Feed Water Heaters, Centrifugal Pumps
Rotative Dry Vacuum Pumps, "EDWARDS" Air Pumps
**Supplies and Repairs for Marine Machinery at Short Notice**
Ask for Literature **Carteret, N. J.**

## OAKUM

BALTIMORE OAKUM CO.
BALTIMORE, MD.
Manufacturers of Hygrade
MARINE AND PLUMBERS' OAKUM
For sale everywhere by all dealers. Established 1872

## JERGUSON



## Engineering Specialties

### REFLEX WATER GAGES

Used on all types of boilers by all the Principal Navies of the World

### "THE WATER SHOWS BLACK"

ADVANTAGES:

Quick and reliable observation of the water level. Safe, sure and durable at high pressures Not affected by cold air drafts. Most effective protection against injuries to boilers and workmen. Easily applied to all types of gauge glass fittings.

When filled with WATER the Reflex Gage always appears BLACK. When empty it instantly shows WHITE. No mistake possible. This feature alone is worth many times the cost of the Reflex.

Send for catalog of Water Gage Apparatus.

MANUFACTURED BY THE

## JERGUSON GAGE & VALVE CO.

504 Broad Building, BOSTON, MASS.


PUMPS, MARINE GLUE.
Ferdinand, L. W., & Co., Boston, Mass.

PUNCHING MACHINES AND SHEARING MACHINES, HYDRAULIC POWER AND HAND.
Niles-Bement-Pond Co., New York.
Watson-Stillman Co., New York.

PYROMETERS.
Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.

QUADRANT DAVITS—See DAVITS.

RAFTS—See LIFE BOATS AND RAFTS.

RAILWAY DRY DOCKS.
Crandall, H. I., & Son Co., East Boston, Mass.

RANGE FINDERS.
Nicholson Ship Log Co., Cleveland, Ohio.
Schuette Recording Compass Co., Manitowoc, Wis.

RANGES.
Sands, A. B., & Son Co., New York.

RASPS.
Nicholson File Co., Providence, R. I.

REAMERS.
Morse Twist Drill & Machine Co., New Bedford, Mass.
Pratt & Whitney Co., New York.

REAMERS—PNEUMATIC.
Independent Pneumatic Tool Co., Chicago and New York.

RECORDING COMPASSES.
Nicholson Ship Log Co., Cleveland, Ohio.
Schuette Recording Compass Co., Manitowoc, Wis.

REDUCING WHEEL.
American Steam Gauge and Valve Mfg. Co., Boston, Mass.

REFLEX WATER GAUGES.
Jerguson Gage & Valve Co., Boston, Mass.

REFRIGERATING ENGINEERS—See ENGINEERS, CONSULTING.

REFRIGERATING PLANTS.
Roelker, H. B., New York.

REGRINDING VALVES—See VALVES.

RELEASING GEAR.
Welin Davit and Lane & DeGroot Co., Consol., Long Island City, N.Y.

RELIEF VALVES—See VALVES.

REVERSING ENGINES.
Chase Machine Co., Cleveland, Ohio.

REVOLUTION COUNTERS.
American Steam Gauge and Valve Mfg. Co., Boston, Mass.
Ashton Valve Co., Boston, Mass.
Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.

RHEOSTATS.
General Electric Co., Schenectady, N. Y.
Simplex Electric Heating Co., Cambridge, Mass.

RIGGING—See WIRE ROPE.

RIVER BOATS—Also see SHIPBUILDERS AND DRY DOCK COS.
Marine Iron Works, Chicago, Ill.
Merrill-Stevens Co., Jacksonville, Fla.
Ward, Chas., Engineering Works, Charleston, W. Va.

RIVETS.
Champion Rivet Co., Cleveland, Ohio.

RIVETING MACHINES, HYDRAULIC AND STEAM POWER.
Independent Pneumatic Tool Co., Chicago and New York.
Niles-Bement-Pond Co., New York.

RIVETERS, PNEUMATIC.
Independent Pneumatic Tool Co., Chicago and New York.

ROLLER BEARINGS—See THRUST BEARINGS.

ROLLS, BENDING AND STRAIGHTENING.
Niles-Bement-Pond Co., New York.

ROOFING PAINTS.
Ferdinand, L. W., & Co., Boston, Mass.

ROPE—Also see WIRE ROPE, TRANSMISSION ROPE, and MANILA AND SISAL ROPE.
Columbian Rope Co., Auburn and New York.
Durable Wire Rope Co., Boston, Mass.
Griscom-Spencer Co., New York.
Phosphor-Bronze Smelting Co., Ltd., Philadelphia, Pa.
Plymouth Cordage Co., North Plymouth, Mass.

ROTARY BLOWERS—See BLOWERS.

ROWBOATS—See LAUNCHES AND YACHTS.

RUBBER BELTING.
Hayward, S. F., & Co., New York.

RUBBER GOODS—Also see Packing—Also see INTERLOCKING RUBBER TILING.
Griscom-Spencer Co., New York.
Hayward, S. F., & Co., New York.
New York Belting & Packing Co., Ltd., New York.
Peerless Rubber Mfg. Co., New York.

RUBBER MATTING CEMENT.
Ferdinand, L. W., & Co., Boston, Mass.

RUBBER TILING—See INTERLOCKING RUBBER TILING.

RUBBER VALVES—See VALVES, RUBBER.

SAFETY VALVES—See VALVES.

SANITARY FITTINGS—See PLUMBING.

SANITARY PUMPS—See PLUMBING.

SEARCHLIGHTS.
Carlisle & Finch Co., Cincinnati, Ohio.
General Electric Co., Schenectady, N. Y.

SENTINEL VALVES—See VALVES.

SEPARATORS—PNEUMATIC—See PNEUMATIC SEPARATORS .

SHAFTING—HOLLOW, SEAMLESS STEEL.
National Tube Co., Pittsburg, Pa.

SHAFT STEEL—See STEEL SHAFTING.

SHALLOW-DRAFT RIVER BOATS—See RIVER BOATS. Also SHIPBUILDERS AND DRY DOCK COMPANIES.

SHEARING MACHINES, HYDRAULIC, STEAM POWER AND HAND.
Niles-Bement-Pond Co., New York.
Watson-Stillman Co., New York.

SHEATHING METAL—See YELLOW METAL; also BRASS AND COPPER.

SHEETING, ASBESTOS.
Johns-Manville, H. W., Co., New York.

SHIPBUILDERS AND DRY DOCK COMPANIES—See also RIVER BOATS.
Bath Iron Works, Bath, Maine.
Fletcher, W. & A., Co., Hoboken, N. J.
Fore River Shipbuilding Co., Quincy, Mass.
Marine Iron Works, Chicago, Ill.
Marvel, T. S., Shipbuilding Co., Newburg, N. Y.
Merrill-Stevens Co., Jacksonville, Fla.
Moran Co., The, Seattle, Wash.
Newport News Shipbuilding & Dry Dock Co., Newport News, Va.
Tietjen & Lang Dry Dock Co., Hoboken, N. J.
Ward, Chas., Engineering Works, Charleston, W. Va.

SHIP CHANDLERS—See CHANDLERY STORES.

SHIP ELEVATORS—See MARINE ELEVATORS.

SHIP FITTINGS.
Ferdinand, L. W., & Co., Boston, Mass.
Griscom-Spencer Co., New York.

SHIP GLUE—See MARINE GLUE.

SHIP LOGS AND SPEED INDICATORS.
Nicholson Ship Log Co., Cleveland, Ohio.
Schuette Recording Compass Co., Manitowoc, Wis.

SHIP STORES—See CHANDLERY STORES.

SHIPYARDS—See SHIPBUILDERS.

SHOWER BATHS—See PLUMBING.

SIGNALS—MARINE.
United States Marine Signal Co., New York.

SLOTTING MACHINES.
Niles-Bement-Pond Co., New York.

SMOOTH-ON.
Smooth-On Mfg. Co., Jersey City, N. J.

SPEED INDICATORS FOR SHIPS, YACHTS AND MOTOR BOATS.
Nicholson Ship Log Co., Cleveland, Ohio.
Schuette Recording Compass Co., Manitowoc, Wis.

SPRINGS, VANADIUM.
American Vanadium Co., Pittsburg, Pa.

STEAM ENGINE INDICATORS—See INDICATORS.

STEAM ENGINES—See ENGINES.

STEAM GAUGES.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Ashton Valve Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
Powell Co., Wm., Cincinnati, Ohio.
Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.
Star Brass Mfg. Co., Boston, Mass.

STEAM HAMMERS.
Niles-Bement-Pond Co., New York.

STEAM AND HOT-BLAST APPARATUS.
American Blower Co., Detroit, Mich.
Sturtevant Co., B. F., Hyde Park, Mass.

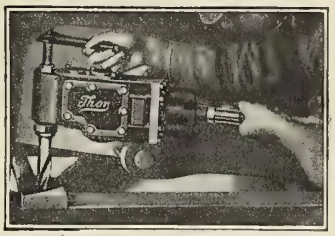

ALBANY GREASE

ALL LUBRICANT—NO WASTE
Unequaled for all moving parts of machinery. Does not drip, gum, and is the cheapest in the end.

ALBANY LUBRICATING CO.
Sole Makers
Adam Cook's Sons, Props.
708-710 Washington St., NEW YORK

Thor

CLOSE QUARTER PISTON AIR DRILLS



Can be used in closer quarters than any other air drill made.

SENT ON TRIAL

We pay express charges both ways if not satisfactory.

*Write for catalog*

INDEPENDENT PNEUMATIC TOOL CO.
CHICAGO NEW YORK PITTSBURG SAN FRANCISCO

The Road to Economy

leads *from* Gasolene and Steam *to*

GAS POWER

Our Producer Gas Power Plants, compact and safe, burn anthracite pea coal, charcoal or coke at an operating cost

85% CHEAPER THAN GASOLENE
35% CHEAPER THAN STEAM

THE Gas Producer

Many harbor, Sound and River Boats, Fishing and Oyster Boats, Pleasure Craft and Yachts have installed our Gas Power Plants and are operating with uniform satisfaction. Those formerly using steam have realized a saving in space and weight of almost one-third, while those using gasolene retained their old engines, with slight change, merely adding the producer.

WE GUARANTEE RESULTS!

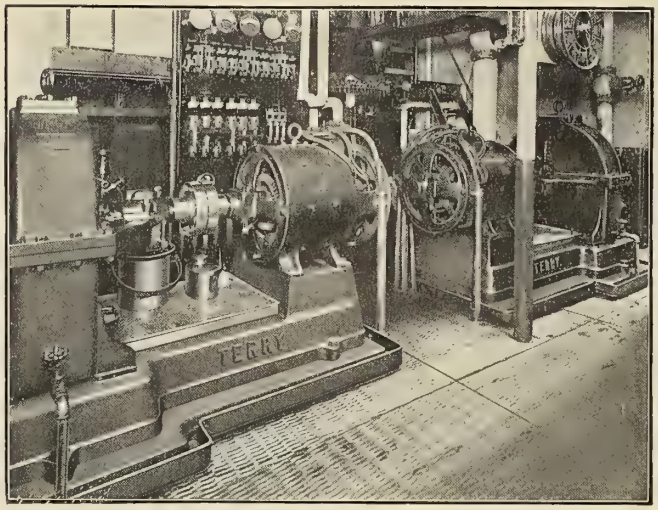
Marine Producer Gas Power Co.
No. 2 RECTOR STREET, NEW YORK

Branch Offices: Allan W. Fulton & Co., 514 E. Pratt St., Baltimore, Md.
The H. E. Ploof Mach'y Co., 20 N. Ocean St., Jacksonville, Fla.
Cameron & Barkley Co., Tampa, Florida.

# 30 K.W. Terry Turbo-Generator Sets

in the Engine Room of the New Steamer

## "CITY OF BALTIMORE"



Steamer "City of Norfolk" is also lighted by TWO 30 K. W. TERRY SETS

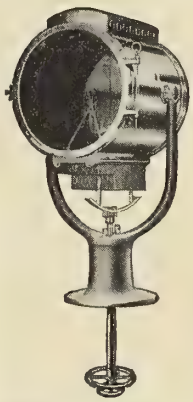
**THE TERRY STEAM TURBINE CO.**

Home Office and Works
Hartford, Conn.

32-29

General Sales Office
90 West St., New York





# SEARCH LIGHT PROJECTORS

**For Ocean, Lake and River Steamers.**

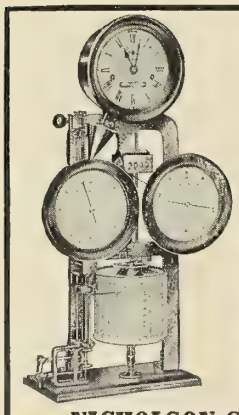
**The Most Satisfactory and Best Electric Search Lights Made.**

*Send for Catalog "A"*

**The Carlisle & Finch Co.**

**234 East Clifton Ave., CINCINNATI, OHIO.**





# Nicholson Ship Log

Far in advance of all other types of Nautical Measuring Instruments

**Absolutely Accurate!** **Highly Efficient!**

It gives the MILEAGE sailed, and shows THE EXACT SPEED PER HOUR on a dial, recording it on a chart FOR EVERY MINUTE OF THE TRIP.

We have one suitable for any purpose. Don't fail to send for our catalog—we will be glad to send you one.

As a foundation for your investigation we will say that Nicholson Ship Logs are in use on 36 of the ships in the United States Navy; that foreign warships, ocean liners, and private yachts carry them, and that practically all of the Great Lakes Passenger Steamers are likewise fitted out. INVESTIGATE.

**NICHOLSON SHIP LOG CO., Cleveland, Ohio**


STEAM PUMPS—See PUMPS.

STEAM SEPARATORS.
Griscom-Spencer Co., New York.

STEAM SPECIALTIES.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Ashton Valve Co., Boston, Mass.
Diamond Power Specialty Co., Detroit, Mich.
Griscom-Spencer Co., New York.
Jerguson Gage & Valve Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
National Tube Co., Pittsburg, Pa.
Penberthy Injector Co., Detroit, Mich.
Powell, Wm., Co., New York.
Power Specialty Co., New York.
Schutte & Körting Co., Philadelphia, Pa.
Star Brass Mfg. Co., Boston, Mass.

STEAM SUPERHEATERS.
Power Specialty Co., New York.

STEAM TRAPS.
American Blower Co., Detroit, Mich.
Lunkenheimer Co., Cincinnati, Ohio.
Schutte & Körting Co., Philadelphia, Pa.
Sturtevant Co., B. F., Hyde Park, Mass.

STEAM TURBINES.
Bath Iron Works, Bath, Maine.
De Laval Steam Turbine Co., Trenton, N. J.
Fletcher, W. & A., Co., Hoboken, N. J.
Fore River Shipbuilding Co., Quincy, Mass.
General Electric Co., Schenectady, N. Y.
Kerr Turbine Co., Wellsville, N. Y.
Parsons Marine Steam Turbine Co., New York.
Terry Steam Turbine Co., Hartford, Conn.

STEAM TURBINE DYNAMOS.
De Laval Steam Turbine Co., Trenton, N. J.
General Electric Co., Schenectady, N. Y.

STEAMERS, LIGHT-DRAFT, RIVER—See RIVER BOATS.

STEEL BALLS.
Bantam Anti-Friction Co., Bantam, Conn.

STEEL, VANADIUM.
American Vanadium Co., Pittsburg, Pa.

STEERING GEARS.
Hyde Windlass Co., Bath, Maine.
Williamson Bros. Co., Philadelphia, Pa.

STEERING ENGINES.
Hyde Windlass Co., Bath, Maine.
Lidgerwood Mfg. Co., New York.
Sheriffs Mfg. Co., Milwaukee, Wis.
Williamson Bros. Co., Philadelphia, Pa.

STEERING WHEELS.
Hyde Windlass Co., Bath, Maine.
Williamson Bros. Co., Philadelphia, Pa.

STOP COCKS—See VALVES.

STOVES—See RANGES.

STRAIGHTENING ROLLS—See ROLLS.

SUPERHEATERS—See STEAM SUPERHEATERS.

SURFACE CONDENSERS—See CONDENSERS.

SWITCHBOARDS—See ELECTRICAL INSTRUMENTS.

TACHOMETERS—HAND AND STATIONARY.
Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.

TACKLE BLOCKS—See BLOCKS.

TANKS—COPPER, GALVANIZED IRON.
Griscom-Spencer Co., New York.
Sands, A. B., & Son Co., New York.

THERMOMETERS—FOR EVERY PURPOSE.
Schaeffer & Budenberg Mfg. Co., Brooklyn, N. Y.

THREADING AND CUTTING MACHINES—See PIPE CUTTING AND THREADING MACHINES.

THROTTLE VALVES—See VALVES.

THRUST BEARINGS.
Bantam Anti-Friction Co., Bantam, Conn.
Vanadium Metals Co., Pittsburg, Pa.

TILING—See INTERLOCKING RUBBER TILING.

TOILET ACCESSORIES.
Sands, A. B., & Son Co., New York.

TOOLS, MACHINE.
Niles-Bement-Pond Co., New York.
Pratt & Whitney Co., New York.
Stow Mfg. Co., Binghamton, N. Y.

TOOLS, MACHINISTS' AND CARPENTERS—See BENCH TOOLS

TOWING HOOKS AND CHOCKS.
American Ship Windlass Co., Philadelphia, Pa.

TOWING MACHINES.
American Ship Windlass Co., Philadelphia, Pa.

TRANSMISSION ROPE—See ROPE.

TRAPS—See STEAM TRAPS.

TUBES—See BOILER TUBES; also BRASS AND COPPER.

TUBE CLEANERS—See BOILER-FLUE CLEANERS.

TUBE CUTTERS—See BOILER TUBE CUTTERS.

TUBE EXPANDERS.
Pratt & Whitney Co., New York.
Watson-Stillman Co., New York.

TUGS—See SHIPBUILDERS.

TURBINES—See STEAM TURBINES.

TURNING ENGINES.
American Ship Windlass Co., Philadelphia, Pa.

TURRET LATHES—See LATHES, TURRET.

TWINE—See ROPE—Also CORDAGE.
Columbian Rope Co., Auburn, N. Y.
Plymouth Cordage Co., North Plymouth, Mass.

TWIST DRILLS.
Morse Twist Drill & Machine Co., New Bedford, Mass.
Pratt & Whitney Co., New York.

UNIONS—See PIPE UNIONS.

VACUUM GAUGES—See STEAM GAUGES.

VALVES—Also see RUBBER VALVES AND WATER VALVES.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Ashton Valve Co., Boston, Mass.
Jerguson Gage & Valve Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
National Tube Co., Pittsburg, Pa.
Powell, Wm., Co., Cincinnati, Ohio.
Power Specialty Co., New York.
Schutte & Körting Co., Philadelphia, Pa.
Star Brass Mfg. Co., Boston, Mass.

VALVES—BALANCED THROTTLE VALVES AND QUADRANT VALVES FOR SHIP ENGINES.
Schutte & Körting Co., Philadelphia, Pa.

VALVES, RUBBER.
Crandall Packing Co., Palmyra, N. Y.

VALVES, WATER.
Continental Iron Works, Brooklyn, N. Y.
Jerguson Gage & Valve Co., Boston, Mass.

VANADIUM.
American Vanadium Co., Pittsburg, Pa.

VANADIUM STEEL.
American Vanadium Co., Pittsburg, Pa.

VARNISH—See PAINT.

VENTILATING FANS—See BLOWERS.

VENTILATORS.
Sands, A. B., & Son Co., New York.

VERTICAL PUMPS—See PUMPS.

VOLTMETERS—See ELECTRICAL INSTRUMENTS.

WATER CLOSETS—PUMP WATER CLOSETS—See PLUMBING.

WATER COLUMNS.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Jerguson Gage & Valve Co., Boston, Mass.
McNab & Harlin Mfg. Co., New York.
Lunkenheimer Co., Cincinnati, Ohio.
National Tube Co., Pittsburg, Pa.
Star Brass Mfg. Co., Boston, Mass.

WATER GAUGES AND ALARMS.
Jerguson Gage & Valve Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.

WATERPROOF LIQUID CEMENT.
Ferdinand, L. W., & Co., Boston, Mass.

WATERPROOF LIQUID GLUE.
Ferdinand, L. W., & Co., Boston, Mass.

WATERPROOF PAINT.
Dixon, Joseph, Crucible Co., Jersey City, N. J.
Ferdinand, L. W., & Co., Boston, Mass.

WATERTUBE BOILERS—See BOILERS.

WATER VALVES—See VALVES, WATER.

WHARF DROPS.
American Ship Windlass Co., Philadelphia, Pa.

WHISTLES.
American Steam Gauge & Valve Mfg. Co., Boston, Mass.
Ashton Valve Co., Boston, Mass.
Lunkenheimer Co., Cincinnati, Ohio.
McNab & Harlin Mfg. Co., New York.
Powell Co., The Wm., Cincinnati, Ohio.
Star Brass Mfg. Co., Boston, Mass.

WHITE METAL
Griscom-Spencer Co., New York.
Phosphor-Bronze Smelting Co., Philadelphia, Pa.
Vanadium Metals Co., Pittsburg, Pa.

WINDLASSES.
American Ship Windlass Co., Philadelphia, Pa.
Hyde Windlass Co., Bath, Me.
Lidgerwood Mfg. Co., New York.
Williamson Bros. Co., Philadelphia, Pa.

WINCHES—See WINDLASSES.

WIRE ROPE
American Ship Windlass Co., Philadelphia, Pa.
Durable Wire Rope Co., Boston, Mass.
Phosphor-Bronze Smelting Co., Ltd., Philadelphia, Pa.

WIRE VANADIUM.
American Vanadium Co., Pittsburg, Pa.

WOOD SAWS—PNEUMATIC.
Independent Pneumatic Tool Co., Chicago and New York.

WRENCHES—Also see PIPE WRENCHES.
Billings & Spencer Co., Hartford, Conn.
McNab & Harlin Mfg. Co., New York.
Williams & Co., J. H., Brooklyn, N. Y.

YACHT GLUE—See MARINE GLUE.

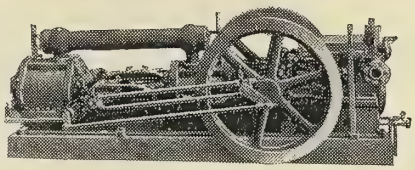
YACHTS—See LAUNCHES AND YACHTS; also SHIPBUILDERS.

YELLOW METAL.
Vanadium Metals Co., Pittsburg, Pa.

ELEPHANT BRAND

DELTA
REG. U. S. PAT. OFF.
THE PHOSPHOR BRONZE SMELTING CO.
2200 WASHINGTON AVENUE, PHILADELPHIA, PA.
ELEPHANT BRAND Phosphor-Bronze
INGOTS, CASTINGS, WIRE, SHEETS, RODS, Etc.
—DELTA METAL—
IN BARS FOR FORGING AND FINISHED RODS
ORIGINAL AND SOLE MAKERS IN THE U. S.

The Invincible Nozzle
Fire Department Supplies
ANDREW J. MORSE & SON
INCORPORATED
221 HIGH ST., BOSTON, MASS.
DIVING APPARATUS


AIR AND GAS
COMPRESSORS
THE NORWALK IRON WORKS
SOUTH NORWALK, CONN.

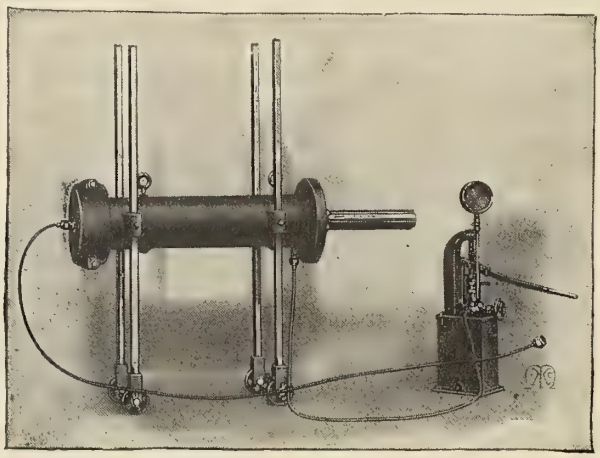
U.S. INFALLIBLE METAL POLISH
It works quickly and easily and keeps its luster. Holds old trade and makes new.
It does not deteriorate. Established 16 years.
3-oz. Box for 10 Cents. 5-lb. Pail $1.00. Liquid $1.00 per Gallon.
Sold by Agents and Dealers all over the World. Ask or write for FREE sample.
GEO. W. HOFFMAN, Expert Polish Maker, 295 E. Washington St., Indianapolis, Ind.
BRANCHES: New York City. Chicago, Ill. San Francisco, Cal.

UNITED STATES METALLIC PACKINGS
For Piston Rods and Valve Stems of Main and Auxiliary Engines
THE UNITED STATES METALLIC PACKING COMPANY
PHILADELPHIA AND CHICAGO

T. S. MARVEL SHIPBUILDING CO.
SHIP and ENGINE BUILDERS
NEWBURG, N. Y.

We Sell all Books on Marine Engineering
Not Out of Print
INTERNATIONAL MARINE ENGINEERING
LONDON
Christopher Street
Finsbury Square, E. C.
NEW YORK
Whitehall Building
17 Battery Place

Simplex means quality, the quality that has stood the test, the "customers test," the test that means hard work well done.
SIMPLEX ELECTRIC HEATING CO.
CAMBRIDGE, MASS.
MONADNOCK BLOCK CHICAGO



**We Build Special Hydraulic Machines**

"We have yet to get better value for our money than in the equipment, or any part of the equipment, that you have constructed for us." That's what Prof. B. H. Hite, W. Va. Agricultural Experiment Station, wrote us after fourteen years designing equipment and trying to get it constructed.

We are constantly building hydraulic presses, pumps, punches, benders, testing apparatus, etc., where the requirements are special and only great accuracy is acceptable. 50 years of experience in hydraulic engineering fit us to figure to the customers' best interests. Our engineers will advise to your best interests.

**THE WATSON-STILLMAN COMPANY**

Engineers, Manufacturers of Hydraulic Pumps, Accumulators, Presses, Punches, Shears, Valves, Fittings, Etc., Machine Tools and Turbine Pumps

**188 FULTON STREET, NEW YORK** 91

**We use HEMP ROPE exclusively in the manufacture of our**

**OAKUM**

It spins a thread of greater length.
It drives better.
It is more economical.
It lasts longer than other Oakum on the market.

*You can demonstrate these facts by a trial.*

**WRITE FOR PRICES**

**W. O. Davey & Sons**

**170 Laidlaw Ave. Jersey City, N. J.**

## INDEX TO ADVERTISERS

PAGES

ALBANY LUBRICATING CO., New York ..... 53
ALLAN, R. S., & CO., Gateshead-on-Tyne, England ..... —
ALMY WATER TUBE BOILER CO., Providence, R. I. ..... 23
AMERICAN BLOWER CO., Detroit, Mich ..... 44
AMERICAN BUREAU OF SHIPPING, New York ..... 38
AMERICAN GASACCUMULATOR CO., Philadelphia, Pa. ..... 42
AMERICAN SHIP WINDLASS CO., Philadelphia, Pa. ..... 38
AMERICAN STEAM GAUGE & VALVE MFG. CO., Boston, Mass., Outside Back Cover
AMERICAN VANADIUM CO., Pittsburgh, Pa. ..... 7
ARMSTRONG CORK CO., Pittsburgh, Pa. ..... 50
ASPINALL'S PATENT GOVERNOR CO., Liverpool, England ..... —
ASHTON VALVE CO., Boston, Mass. ..... Inside Front Cover

BABCOCK & WILCOX CO., New York ..... 22
BALDT ANCHOR CO., Chester, Pa. ..... 35
BALTIMORE OAKUM CO., Baltimore, Md. ..... 52
BANTAM ANTI-FRICTION CO., Bantam, Conn. ..... 20
BATH IRON WORKS, Bath, Maine ..... 36
BILLINGS & SPENCER CO., Hartford, Conn. ..... 57
BLAKE & KNOWLES STEAM PUMP WORKS, New York ..... 18
BOURSE, THE, Philadelphia, Pa. ..... 38
BRIDGEPORT MOTOR CO., Bridgeport, Conn. ..... 35
BRITISH MANNESMAN TUBE CO., LTD., London, England ..... 26
BROWN, ARTHUR R., London, England ..... 26
BUFFALO GASOLENE MOTOR CO., Buffalo, N. Y. ..... 33
BUNKER, E. A., New York ..... 9
BUTTERFIELD W. P., LTD., Shipley, England ..... 26

CALLENDER & CO., G. M., LTD., London, England ..... —
CARLISLE & FINCH CO., Cincinnati, Ohio ..... 54
CEDERVALL & SONER, F. R., Gothenburg, Sweden ..... 28
CHAMPION RIVET CO., Cleveland, Ohio ..... 13
COLUMBIAN ROPE CO., Auburn and New York Below Table of Contents, in Front of Magazine
CONTINENTAL IRON WORKS, Brooklyn, N. Y. ..... 18
COOK'S SONS, ADAM, New York ..... 53
COX & STEVENS, New York ..... 51
CRANDALL, H. I., & SON CO., East Boston, Mass. ..... 48
CRANDALL PACKING CO., Palmyra, N. Y. ..... 21

DART MFG. CO., E. M., Providence, R. I. ..... 36
DAVEY, W. O., & SONS, Jersey City, N. J. ..... 56
DAVIDSON, M. T., CO., New York ..... 49
DECKER, DELBERT H., Washington, D. C. ..... 34
DE LAVAL STEAM TURBINE CO., Trenton, N. J. ..... 57
DIXON CRUCIBLE CO., JOS., Jersey City, N. J. ..... 9
DONNELLY, W. T., New York ..... 35 and 51
DURABLE WIRE ROPE CO., Boston, Mass. ..... 44

ERIE FORGE CO., Erie, Pa. ..... 46
EUREKA FIRE HOSE MFG. CO., New York ..... 50

FAESSLER, J. MFG. CO. Moberly, Mo. ..... 50
FERDINAND & CO., L. W., Boston, Mass. ..... 50
FLETCHER CO., W. & A., Hoboken, N. J. ..... 36
FORE RIVER SHIPBUILDING CO., Quincy, Mass. ..... 35
FREY, LOUIS & CO., New York ..... 51

PAGES

GENERAL ELECTRIC CO., Schenectady, N. Y., Page facing leading article in front; also Page 31
GREENWOOD & BATLEY, LTD., Leeds, England ..... 29
GRISCOM-SPENCER CO., New York ..... 10

HAYWARD & CO., S. F., New York ..... 46
HEATH & CO., LTD., London, England ..... 25
HOFFMAN, GEO. W., Indianapolis, Ind ..... 55
HYDE WINDLASS CO., Bath, Me ..... Inside Front Cover

INDEPENDENT PNEUMATIC TOOL CO., Chicago and New York .... 53
INTERNATIONAL ACHESON GRAPHITE CO., Niagara Falls, N. Y .. 38
ISHERWOOD, J. W., Middlesbrough, England ..... 28

JERGUSON GAGE & VALVE CO., Boston, Mass ..... 52
JOHNS-MANVILLE CO., H. W., New York ..... 49

KATZENSTEIN & CO., L., New York ..... 24
KERR TURBINE CO., Wellsville, N. Y ..... 47
KINGSFORD FOUNDRY & MACHINE WORKS, Oswego, N. Y ..... 18

LIDGERWOOD MFG. CO., New York ..... Inside Front Cover
LUNKENHEIMER CO., THE, Cincinnati, Ohio ..... Inside Front Cover

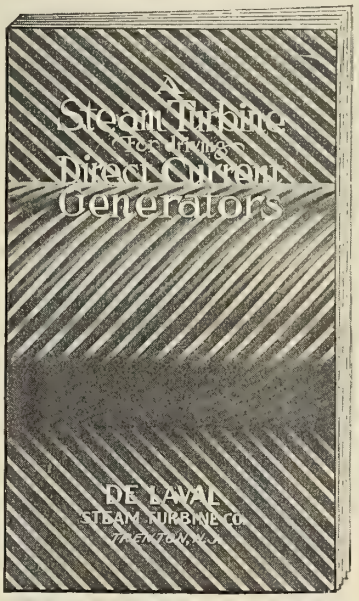
McNAB & HARLIN MFG. CO., New York ..... 23
MARINE IRON WORKS, Chicago, Ill ..... Outside Front Cover
MARINE PRODUCER GAS POWER CO., New York ..... 53
MARVEL, T. S., SHIPBUILDING CO., Newburgh, N. Y ..... 55
MERRILL-STEVENS CO., Jacksonville, Fla ..... 35
MIETZ, A., New York ..... 33
MORSE, ANDREW J., & SON, INC., Boston, Mass ..... 55
MORSE TWIST DRILL & MACHINE CO., New Bedford, Mass ..... 36
MOSHER WATER TUBE BOILER CO., New York ..... 22

NATIONAL TUBE CO., Pittsburgh, Pa ..... 20
NEW LONDON SHIP & ENGINE CO., Groton, Conn ..... 19
NEWPORT NEWS SHIPBUILDING & DRY DOCK CO., Newport News, Va ..... 35
NEW YORK BELTING & PACKING CO., New York ..... 11
NICHOLSON FILE CO., Providence, R. I ..... 45
NICHOLSON SHIP LOG CO., Cleveland, Ohio ..... 54
NILES-BEMENT-POND CO., New York ..... 52
NORWALK IRON WORKS, South Norwalk, Conn ..... 55

OSTERMOOR & CO., New York ..... 9
OTIS ELEVATOR CO., New York ..... Inside Back Cover

PARK & PATERSON, Glasgow, Scotland ..... 27
PARSONS MARINE STEAM TURBINE CO., New York ..... 34
PEERLESS RUBBER MFG. CO., New York ..... 16
PENBERTHY INJECTOR CO., Detroit, Mich ..... 23
PERKIN & CO., LTD., Leeds, England ..... —






# A Steam Turbine for Driving Direct Current Generators

The De Laval Multi-Stage Geared Turbine combines all the advantages of steam turbines in the way of simplicity, ability to utilize high vacuums, small space requirements and small cost for attendance with the reliability and efficiency of slow-speed direct current generators.

It is the ideal unit for the local trolley circuit, since it relieves the A. C. system of part of the load and increases the plant efficiency by eliminating the several transformations of energy by rotary converters, etc., also renders the local circuits independent of accidents to the A. C. apparatus.

The cost of the outfit is less than a proportionate part of the main A. C. turbo-generators, transformers and rotaries that it takes the place of.

For descriptions, photographs and further details, call on our representative at the Crocker-Wheeler booth. Ask for a copy of the booklet No. 46, illustrated herewith, describing this turbine and discussing the respective merits of different types of turbines.

**DE LAVAL STEAM TURBINE CO.**
**TRENTON, N. J.** 51

OUR new wrench catalog lists upward of 800 different styles and sizes of machine wrenches. Yours for the asking.

**THE BILLINGS & SPENCER CO.**
HARTFORD, CONN.
**CLAIRE L. BARNES & CO., McCormick Bldg., Chicago**

All Plymouth Rope Goes Through Rigid Inspection. A 45,000 pound pull failed to snap this 7½-inch rope though it is only expected to hold 43,000 pounds.

# "PLYMOUTH" STRENGTH

## *is made certain by tests*

If you buy rope at a low price you may expect to get low working power. Since this follows the law of compensation, when you want economy in rope don't let a *price* mislead you. *Remember—service is the measure of rope value.*

# PLYMOUTH ROPE

## "The Rope You Can Trust"

is world-famed for wear, because only durable Manila fiber is used. It is tested to give assurance of uniform strength—you'll find it always does the work.

Tug hawsers get the hardest kind of usage. Rope goes to pieces quickly in this kind of work, making wearing-power here a question of vital importance. PLYMOUTH hawsers are specialties—as is every PLYMOUTH rope—they are made to *last.*

A few dollars more, invested in PLYMOUTH, is bound to be a big saving in the end. Old seamen always ask for PLYMOUTH—they know it's a saving. Buyers of long experience have also proved this. There are many reasons why PLYMOUTH rope is the best investment. Let us tell you of them. Send for our free booklets, "Plymouth Products."

THE MARK OF LEADERSHIP

PLYMOUTH CORDAGE COMPANY
NORTH PLYMOUTH, MASS.
*Distributing Agents in All Big Ports*



| | PAGES |
|---|---|
| PHOSPHOR BRONZE SMELTING CO., Philadelphia, Pa | 55 |
| PLYMOUTH CORDAGE CO., North Plymouth, Mass | 58 |
| POWELL, WILLIAM, CO., THE, Cincinnati, Ohio | 8 |
| POWER SPECIALTY CO., New York | 20 |
| ROBB ENGINEERING CO., LTD., South Framingham, Mass. | 37 |
| ROBERTS SAFETY WATER TUBE BOILER CO., Red Bank, N. J. | 22 |
| ROELKER, H. B., New York | 24 |
| ROSS SCHOFIELD CO., New York | 23 |
| RUGGLES-COLES ENGINEERING CO., New York | 41 |
| SANDS & SON CO., A. B., New York | 47 |
| SCHAEFFER & BUDENBERG MFG. CO., Brooklyn, N. Y. | 13 |
| SCHUETTE RECORDING COMPASS CO., Manitowoc, Wis. | 40 |
| SCHUTTE & KÖRTING CO., Philadelphia, Pa. | 17 |
| SEAMLESS STEEL BOAT CO., LTD., Wakefield, England | 32 |
| SHELBY STEEL TUBE CO., Pittsburgh (See National Tube Co.) | — |
| SHERIFFS MFG. CO., Milwaukee, Wis. | 24 |
| SIMPLEX ELECTRIC HEATING CO., Cambridgeport, Mass. | 55 |
| SIROCCO ENGINEERING CO. (See American Blower Co.) | — |
| SISSON, W., & CO., LTD., Gloucester, England | 26 |
| SMIT, L., & CO., Rotterdam, Holland | 29 |
| SMITH'S DOCK CO., LTD., Middlesbrough, England | 29 |
| SMOOTH-ON MFG. CO., Jersey City, N. J. | 28 |
| SMULDERS, F. A., Schiedam, Holland | 25 |
| SOTHERN, J. W., London, England | 26 |
| STANDARD MOTOR CONSTRUCTION CO., Jersey City, N. J. | 33 |
| STAR BRASS MFG. CO., Boston, Mass. | 21 |
| STARRETT CO., L. S., Athol, Mass | 8 |
| STEARNS, W. B., Boston, Mass, | 51 |
| STOW MFG. CO., Binghamton, N. Y. | 24 |
| STURTEVANT CO., B. F., Hyde Park, Mass. | 17 |
| SULZER BROS., Winterthur, Switzerland | 7 |
| TERRY STEAM TURBINE CO., Hartford, Conn. | 54 |
| TIETJEN & LANG DRY DOCK CO., Hoboken, N. J. | 35 |
| TROUT, H. G., CO., Buffalo, N. Y. | 24 |
| UNITED STATES MARINE SIGNAL CO., New York | 34 |
| UNITED STATES METALLIC PACKING CO., Philadelphia, Pa | 55 |
| VANDA CO., New York | 51 |
| VAN NOSTRAND CO., D., New York | 36 |
| WALKER, W. G., & SONS, Edinburgh, Scotland | — |
| WARD, CHAS., ENGINEERING WORKS, Charleston, W. Va. | 23 |
| WATSON-STILLMAN CO., New York | 56 |
| WELIN DAVIT & LANE & DE GROOT CO. Long Island City, N. Y. | 12 |
| WERF GUSTO, Schiedam, Holland | 25 |
| WESTON ELECTRICAL INSTRUMENT CO., Waverly Park, Newark, N. J. | 43 |
| WHEELER CONDENSER & ENGINEERING CO., Carteret, N. J. | 52 |
| WHITFIELDS BEDSTEADS, LTD., Birmingham, England | 32 |
| WILLIAMS & CO., J. H., Brooklyn, N. Y. | 37 |
| WILLIAMSON BROS. CO., Philadelphia, Pa | 38 |
| WILSON & SONS, R., South Shields, England | — |
| ZYNKARA CO., Ltd., Newcastle-on-Tyne, England | 13 |

Dilatory Methods Today are Intolerable,—Time is Money—and

# Time Saved in Freight Handling is of the Utmost Importance

Not only does it mean MORE from a dividend standpoint, but it creates that quicker service insistently demanded by both Shipper and Consignee.

Take the matter of freight handling from vessels to the dock, and vice-versa. If delivery levels were constant, the movement of freight to and from vessels and the dock might be maintained by the old, time-honored method of transfer comprehended by a husky longshoreman and his truck, but—when the water is high or low, instead of one man, behold! from two to four to a truck;—from ONE to THREE men's extra effort to move what *ONE man might EASILY move if the gangways were equipped with the*

# OTIS INCLINED DOCK ELEVATOR

(Which we manufacture under Reno Patents)

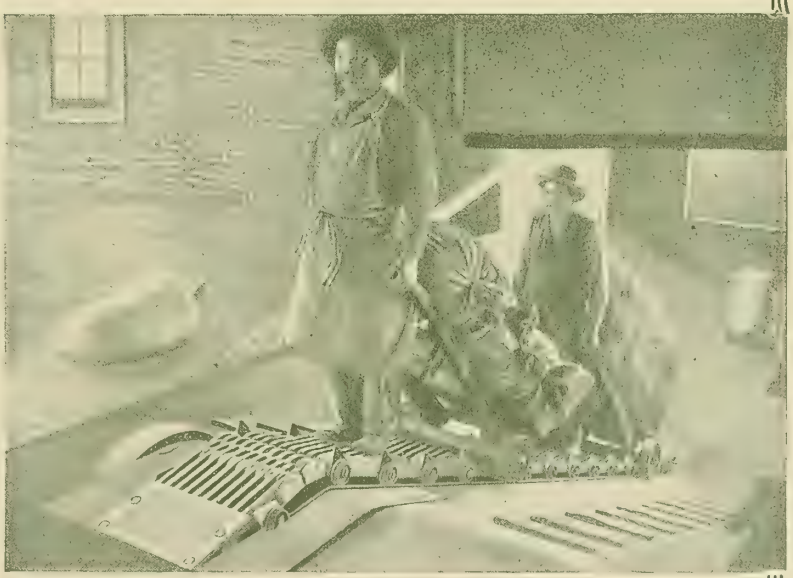
**and the Freight Handled in 60% to 80% LESS Time than Ordinarily Required,—thereby SAVING 60% to 80% of the Old-Method Cost**

For example: *Above is a typical view of one* of the gangways at the Metropolitan Steamship Dock, Boston, Mass., using the Otis Inclined Dock Elevator. Three have been installed on this dock, and two on the Merchants' and Miners' Transportation Dock at Savannah, Ga.—and many others elsewhere.

No matter what the load on the truck may be, the weight of same, or the grade of the gangway, ONE man handles the load. This elevator will deliver 1960 loaded trucks (with men) per hour at a speed of 200 ft. per minute. It is operated by a 5 H. P. electric motor at a current cost of six cents per hour. There can never be congestion at the gangway, the man and truck comes to the elevator, engages, *and moves; no balks, no slow-downs.* There is nothing to break, nothing to get out of order; the operation is positive and continuous and absolutely safe for the workers. Its capacity is limitless. It cannot be overloaded.

**We make similar Elevators adapted to every condition of Freight Handling Service. The cost of an equipment of this kind is trifling, results considered, and such apparatus should be on every dock and pier.**

Without any obligation whatsoever, our Engineering Department will supply you full information, show the way to best meet your specific requirement, and submit exact installation cost and upkeep, for both passenger and freight handling apparatus. Correspondence invited. Write to us.



## Otis Elevator Company

**17 Battery Place, New York City**

**Offices in all principal cities in the world**

# Greeting:

FROM THE AMERICAN STEAM GAUGE AND VALVE MANUFACTURING COMPANY, OF BOSTON, MASSACHUSETTS

TO our friends and customers we extend our hands in friendly, thankful greeting. ¶ Without your kindly co-operation this company would not be in existence. ¶ But with your help we have just closed the best and most prosperous year in our career—hence our gratitude to you. ¶ When we make a sale we endeavor to make a friend. ¶ Never before in history did friendship play so big a part in business as it does to-day. ¶ Commerce is based on confidence; and that we may ever be worthy of your esteem is our earnest wish. And so to you, our customers—the old and new, and those to be—we wish to say: Your interests are ours; and if we can help you solve some of your problems we will be glad. Our business is to serve. ¶ We wish you for the new year everything you wish for yourself

AMERICAN STEAM GAUGE AND VALVE MANUFACTURING COMPANY, of Boston, Massachusetts,
RALPH B PHILLIPS, Treasurer and General Manager